NEC

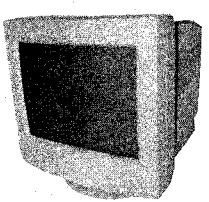
MODELS JC-1744UMA/B/R

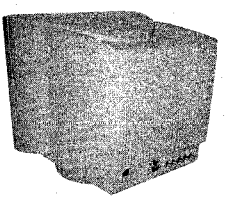
COLOR MONITOR MultiSync® P750

SERVICE MANUAL

PART NO. 599910416

Better Service
Better Reputation
Better Profit





NEC Corporation
TOKYO, JAPAN

WARNING

The SERVICE PERSONNEL should have the appropriate technical training, knowledge and experience necessary to:

- Be familiar with specialized test equipment, and
- Be careful to follow all safety procedures associated with high voltage CRT circuit designs to minimize danger to themselves and their coworkers.

To avoid electrical chocks, this equipment should be used with an appropriate power code and be connected only to a properly grounded AC outlet.

This equipment utilized a micro-gap power switch. Turn off the set by first pushing the front panel power switch. Next, remove the power cord from the AC outlet.

To prevent fire or shock hazards, do not expose this unit to rain or moisture.

This symbol warns the personnel that un-insulated voltage within the unit may have sufficient magnitude to cause electric shock.

This symbol alerts the personnel that important literature concerning the operation and maintenance of this unit has been included.
Therefore, it should be read carefully in order to avoid any problems.

PRODUCT SAFETY CAUTION

1. When parts replacement is required for servicing, always use the manufacturer's specified replacement.
2. Comply with all caution and safety-related notes on the product display chassis and picture tube.
3. When replacing the component, always be certain that all the components are put back in the place.
4. When servicing display monitor unit, it is required that the provided lead dress is used in the high voltage circuit area.
5. It is also recommended that shatter proof goggles are worn, when removing installing and handling the picture tube. People not equipped with the proper precautionary measures mentioned should keep the picture tube away from body while handling.
6. X-radiation precaution

   This product contains critical electrical and mechanical parts essential for X-ray protection. Normal anode voltage is 25.0kV at zero beam picture tube current under AC100-120 (A ver) / AC220-240 (B ver / R ver) input, and anode voltage must not exceed the voltages shown below under any operation condition. To measure anode voltage set brightness for very dim picture, and use a high impedance volt meter between chassis and anode lead and measure high voltage. If high voltage exceeds the specifications on the chassis schematic diagram, take the necessary corrective action.

beam current	at 0 mA	at 0.5 mA	at 1.0 mA
A ver / B ver / R ver	32.30kV	30.70kV	30.50kV

7. As for a connector, pick and extract housing with fingers properly since a disconnection and improper contacts may occur, when wires of the connector is routed.
8. Use a proper screwdriver. If you use screwdriver that does not fit, you may damage the screws.

CONTENTS

	Page No.
SPECIFICATIONS	1
MONITOR ADJUSTMENT CONTROLS	3
SERIAL NUMBER INFORMATION	7
ASSEMBLY	8
ADJUSTMENT PROCEDURES	20
INSPECTION	62
TROUBLE SHOOTING	69
CIRCUIT DESCRIPTION	105
REPLACEMENT PARTS LIST	156
PRINTED WIRING BOARDS	174
BLOCK DIAGRAM	179
SCHEMATIC DIAGRAMS	181

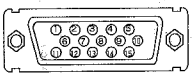
Monitor Specifications		MultiSync P750	Notes
Picture Tube	Diagonal Viewable Image Size Radius	17 INCH 15.6 inches 1210 mm	90° deflection 0.25 mask pitch, medium-short persistence phosphor, CromaClear™ CRT, multi-layered, anti-static screen coating, semi-tint screen and OptiClear coating.
Active Display Area (Factory Setting)		306 x 230 mm 12.0 x 9.1 inches	Dependent upon signal timing used and does not include border area.
Active Display Area (Full Scan)		316 x 237 mm 12.4 x 9.3 inches	Dependent upon signal timing used and does not include border area.
Synchronizasion Range	Horizontal Vertical	31kHz to 94kHz 55Hz to 160Hz	(Automatically) (Automatically)

Monitor Specifications	MultiSync P750
Dimensions (W) x (H) x (D)	403 mm(W) x 430 mm x 449 mm / 15.9 in x 16.9 in.x 17.7 in
Weight	20.0 Kg / 44.1 lbs.
Current Rating	1.9 A (JC-1744UMA) / 1.0 A (JC-1744UMB/R)
Display Analog Input	Unlimited number of colors (depends upon video card).
Input Signal	Video: ANALOG 0.7 Vp-p/75 Ohms Sync.: Separate sync. TTL Level. Horizontal sync. Positive/Negative Vertical Sync. Positive/Negative Composite Sync. (Positive/Negative)(TTL Level) Sync. on Green video (Positive) 0.7 Vp-p and sync. (negative) 0.3 Vp-p.
Power Supply	AC 100-120 Volts 50/60Hz (JC-1744UMA) / AC 220-240 Volts 50/60Hz (JC-1744UMB/R)
Environmental Considerations	Operating Temperature 0° C to + 35° C Humidity 30% to 80% 0-10,000 feet Storage Temperature -20° C to + 60° C Humidity 10% to 90% 0-45,000 feet

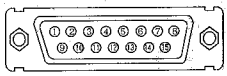
NOTE: All technical specifications are subject to change without notice.

Pin Assignment Table

MINI D-SUB 15P

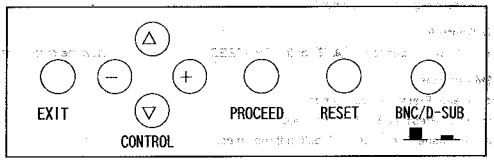


D-SUB 15P



Pin No.	VGA/8514/A Mini D-SUB-15P	Macintosh Ⅱ with Adapter D-SUB-15P
1	RED	GROUND
2	GREEN	RED
3	BLUE	H/V COMP.SYNC.
4	GROUND	SENSE 0
5	GROUND	GREEN
6	GROUND	GROUND
7	GROUND	SENSE 1
8	GROUND	NC
9	NC	BLUE
10	GROUND	SENSE 2
11	GROUND	GROUND
12	DDC DATA	NC
13	H.SYNC., COMP.SYNC.	GROUND
14	V.SYNC.	GROUND
15	DDC CLOCK	NC

MONITOR ADJUSTMENT CONTROLS



OSM buttons on the front of the monitor function as follows :

	Main menu	Sub menu
EXIT	Exits the OSM Controls.	Exits to the OSM main menu.
CONTROL ▲/▼	Moves the highlighted area up/down to select one of the controls.	Moves the highlighted area up/down to select one of the controls.
CONTROL +/−	Moves the highlighted area left/right to select one of the controls.	Moves the bar in the + or - direction to increase or decrease the adjustment.
PROCEED	Has no function.	Only executes control or enters sub, sub-menu.
RESET	Resets all the controls within the highlighted menu to the factory setting.	Resets the highlighted control to the factory setting.

NOTE: When RESET is pressed in the main and sub-menu, a warning window will appear allowing you to cancel the reset function.

OSM Elements: On-Screen Manager windows typically have the following elements:
Highlight: Indicates the selected menu or control in green. Inactive tab is indicated in yellow.
Scroll Bar: Indicates direction of adjustment.

Accessing OSM Controls

Press any of the CONTROL buttons +/-, ▲/▼ or the PROCEED or EXIT button to view the current settings.

Turning off OSM Controls

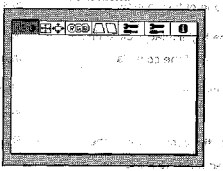
When in the main menu: Press the EXIT button.
When in the sub-menu: Press the EXIT button twice.
When in the sub, sub-menu: Press the EXIT button three times.

OSM Controls Menus

Main Menu

OSM control main menu of icons gives you an overview of the selection of controls available.
When OSM controls are activated, icons are displayed at the top of the menu.
If an arrow(→) is displayed, it indicates further choices are available.

Main Menu



The icons control the following:

☼◑ Brightness/Contrast Control

Brightness: Adjusts the overall image and background screen brightness.
Contrast: Adjusts the image brightness in relation to the background.
Degauss: Eliminates the build-up of stray magnetic fields which alter the correct scan of the electron beams and affect the purity of the screen colors, focus and convergence. When activated, your screen image will jump and waver a bit as the screen is demagnetized.
Caution: Please allow a minimum of 20 minutes to elapse between uses of the Degauss function.

Size and Position Controls

Left/Right: Moves the image horizontally (left or right).
Up/Down: Moves the image vertically (up or down).
Narrow/Wide: Increases or decreases the horizontal size of the image.
Short/Tall: Increases or decreases the vertical size of the image.

(RGB) Color Control/AccuColor Control System

Color Presets 1 through 5, selects the desired color setting. The bar is replaced by the color setting choice from 1 to 5. Each color setting is adjusted at the factory to the stated degree Kelvin. If a setting is adjusted, the name of the setting will change from degree Kelvin to Custom.

Red Green Blue : Increases or decreases red, green, or blue depending upon which is selected. The change in color will appear on screen and the direction (increase or decrease) will be shown by the bars.

Note on Controls in AccuColor Control System Menu:

Exit: Exits to the main menu.

Cursor ▲/▼: Moves the highlighted area up/down to select one of the choices.

Cursor +/-: Moves the bar in the + or - direction to increase or decrease the adjustment or selects the color setting (1 through 5).

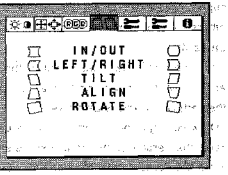
Reset: Resets the current color setting to the factory setting.

NEC's AccuColor Control system allows you to change your on-screen colors by adjusting the monitor's red, green ,and blue color guns individually.

You can also access five industry standard color temperature settings.

Geometry Controls

Geometry Controls Menu



The **Geometry** controls allow you to adjust the curvature or angle of the sides of your display.

Sides In/Out (pincushion): Increases or decreases the curvature of the sides either inward or outward.

Sides Left/Right (pincushion balance): Increases or decreases the curvature of the sides either to the left or right.

Sides Tilt (parallelogram): Increases or decreases the tilt of the side either to the left or right.

Sides Align (trapezoidal): Increases or decreases the bottom of the screen to be the same as the top.

Rotate (raster rotataion): Rotates the entire display clockwise or counter clockwise.

Note on Controls in the Geometry Controls Menu:

Exit: Exits to the main menu.

Cursor ▲/▼: Moves the highlighted area up/down to select one of the choices.

Cursor +/-: Moves the bar in the + or - direction to increase or decrease the adjustment.

Reset: Resets the current highlighted control to the factory setting.

Tools 1

Provides a list of optional adjustments which include the following:

Language: OSM controls menus are available in 6 languages.

OSM Position: You can choose where you would like the OSM controls image to appear on your screen. Selecting OSM Position allows you to manually adjust the OSM controls menu left, right, up or down.

OSM Turn Off: The OSM controls menu will stay on as long as it is in use.

In the OSM TurnOff sub-menu, you can select how long the monitor waits after the last touch of a button to shut off the OSM controls menu. The preset choices are 10, 20, 30, 60, 120 seconds.

OSM Lockout

This control completely locks out access to all OSM controls functions. When attempting to activate OSM controls while in the lockout mode, a screen will appear indicating that OSM controls are locked out.

To activate the OSM Lockout function, press PROCEED, then "▲" and hold down simultaneously.

To deactivate the OSM Lockout, press PROCEED, then "▲" and hold down simultaneously.

IPM System Off Mode: Enable: The IPM System works normaly and all stages of energy savings are utilized.

Disable: The Off Mode of the IPM Sytem is not used.

Note: For standard systems and graphics boards, keep the factory setting at ENABLE.

Factory Preset

Selecting Factory Preset allows you to reset all OSM control settings back to the factory settings.

A warning statement will appear to confirm that you to want to reset ALL settings. Individual settings can be reset by highlighting the control to be reset and pressing the **RESET** button.

Tools 2

Moire canceler

Moire is a wavy pattern which can sometimes appear on the screen. The pattern is repetitive and superimposed as rippled images. When running certain applications, the wavy patern is more evident than in others. To reduce moire, adjust the On/Level by using the +/- CONTROL buttons.

Linearity

This selection allows you to adjust the spacing of the area on the screen. The purpose of this control is to ensure that a one-inch circle is a true one-inch circle wherever it is on the screen. The best way to determine the vertical linearity is as follows:

- Draw equally spaced horizontal lines using a drawing application that has a ruler.
- Use the Vertical control to adjust the spacing between the lines near the center of your screen.
- Use the Vertical Balance control to adjust the lines near the top and bottom of your screen.

Information

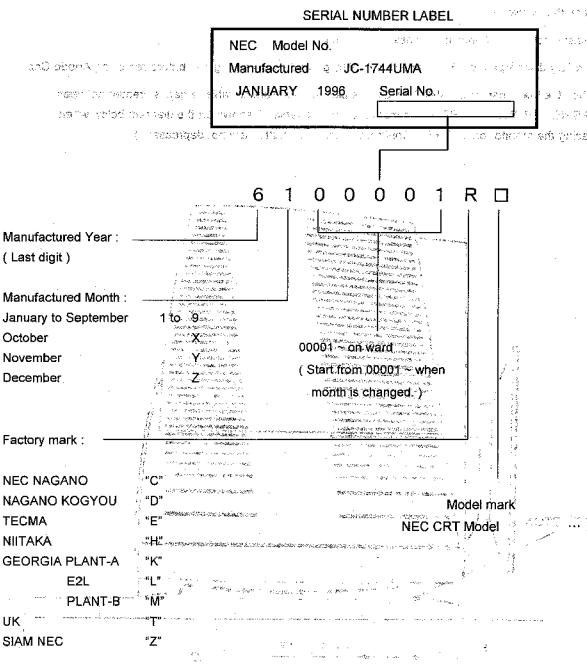
Provides you with additional information which includes the following:

Fitness Tips: The Fitness Tips provide you with helpful reminders to periodically rest your eyes. You may select how frequently the reminders are displayed based upon your individual needs. Select an interval form 15, 30, 45, 60, 90, 120 minutes for the tips to appear. When the tips appear, follow the advise of the tips and press EXIT to clear.

Display Mode: Indicates the current mode and frequency setting of the monitor.

SERIAL NUMBER INFORMATION

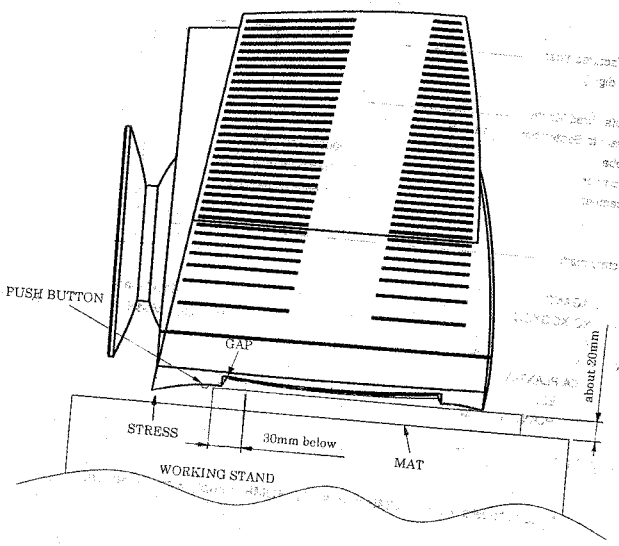
Refer to the serial number information shown below.



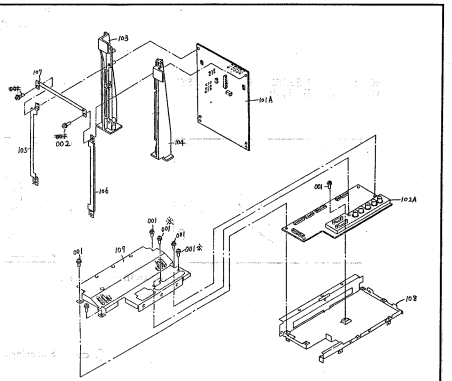
Note : Models JC-1744UMB and JC-1744UMR comply with the above.

ASSEMBLY

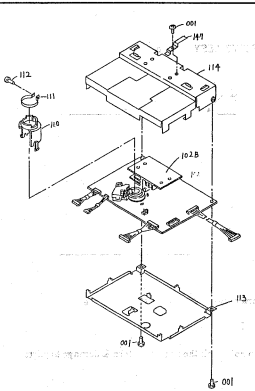
- Before you disassemble the set, turn off power and pull out the power plug.
- Use the appropriate screwdrivers that fits the screws. If you use screwdriver that does not fit, you may break the screws.
- Disassembly is the opposite process of assembly.
- Carefully discharge the CRT anode potential by grounding to coating dag before removing Anode Cap.
- When the lower part of CABINET FRONT is placed on a working table, a gap is created between CABINET FRONT and CRT. Lay a mat on a working table as shown bn the diagram below when placing the monitor on its CRT. (Confirm that the push button are not depressed.)



REMARK	SYMBOL
※ Torque 4.0 ~ 6.0(kgf·cm)	

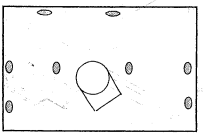


REMARK	SYMBOL

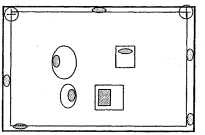


NO.		(DESCRIPTION)	(PART No.)	(Q'ty)
		SOLDE. ROSIN CORE60%	90143030	

Solder the PLATE SHIELDING(CRT,F)ASSY on the PWE-469B. (8point)



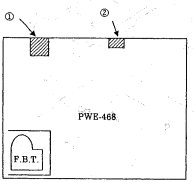
Solder the PLATE SHIELDING(CRT,B) on the PWE-469B. (9point)



PWE-469B Soldering side

-- Soldering point.

Devide DEF FWB ASSY as per scketch.

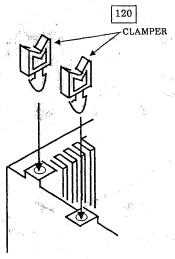


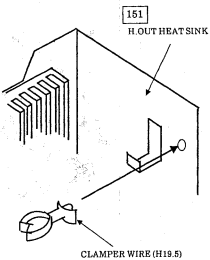
Note : Throw away the Extra Portion ①~②

Please keep PWE-468

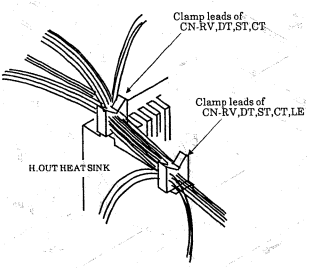
Please do not break the circuit pattern & damage to parts.

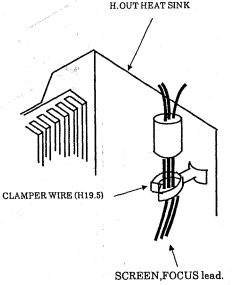
Mount the CLAMPER,WIRE to H.OUT HEAT SINK.



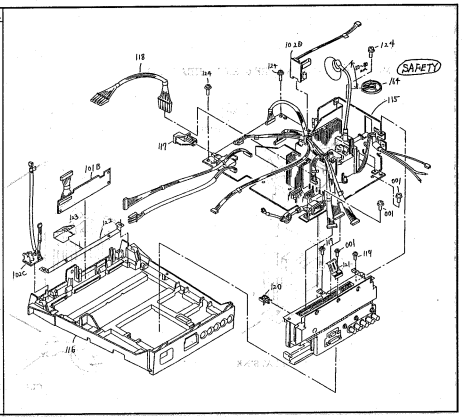


Clamp the wire with CLAMPER on H.OUT HEAT SINK.

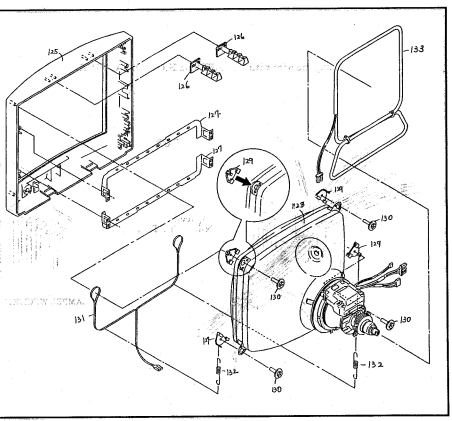




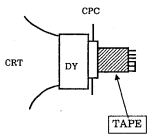
REMARK	SYMBOL
Clamp CN-RV lead with CLAMPER.	120



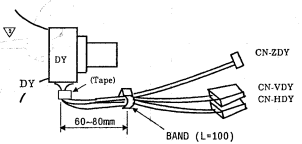
REMARK	SYMBOL



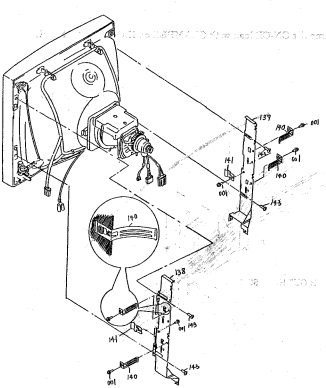
Attached TAPE,GL FIBER 19*30 to CRT neck.(1turn)



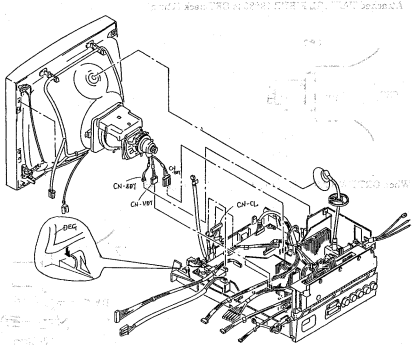
When CRT PWB ASSY is take off fromCRT ,change TAPE.



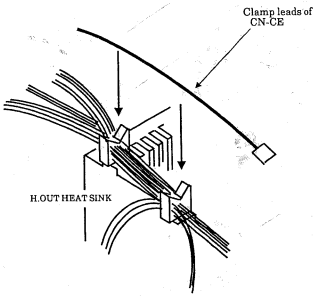
REMARK	SYMBOL



REMARK	SYMBOL
Insert CN-HDY, VDY, ZDY and CN-CL to post on DEF PWB ASSY.	
Mount Anode Cap as follows. 	

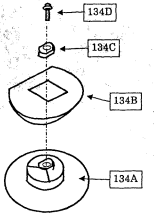


Clamp the CN-CE lead with CLAMPER on H.OUT HEAT SINK.

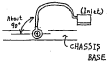


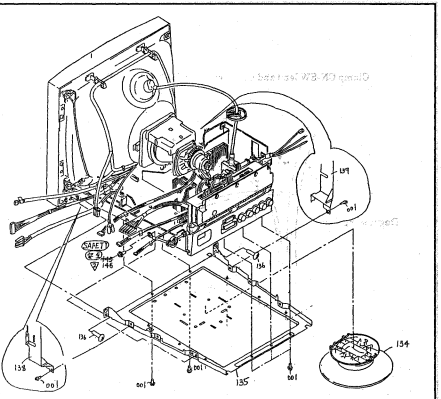
Applied in GP.

Assembled Revolbing Stand.

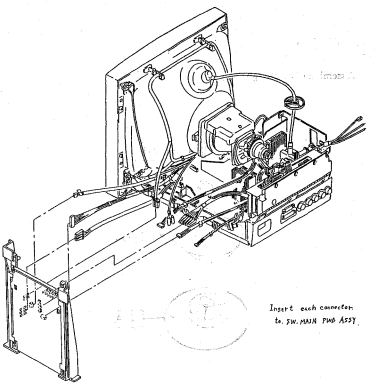


REMARK	SYMBOL
Direction of CN-GND terminal is as follows.	145

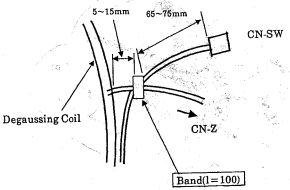




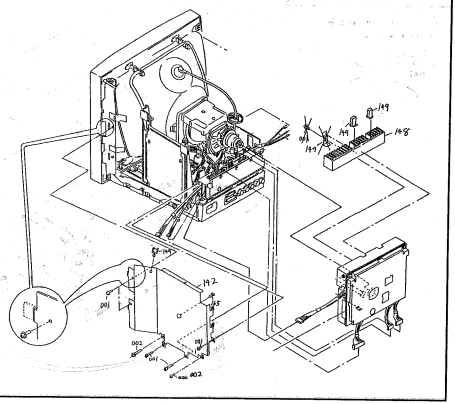
REMARK	SYMBOL



Clamp CN-SW lead and CN-Z lead with BAND(L = 100).

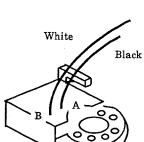


REMARK	SYMBOL
Insert CRT SOCKET on CRT PWB to CRT. And Screw BRACKET (HOLDER) (Torque : 9.0~10.0kgf-cm)	

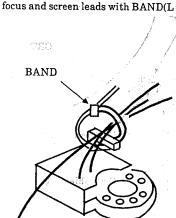


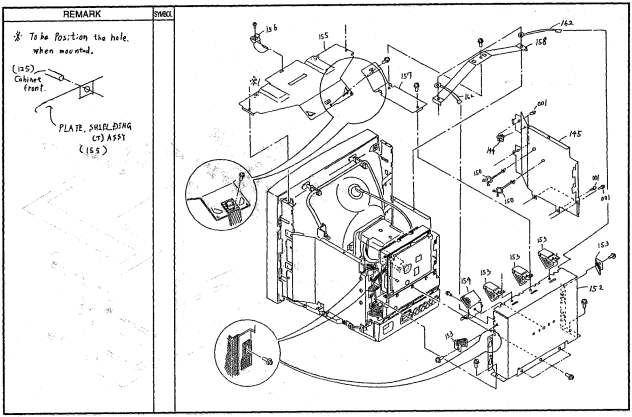
Insert Focus lead from F.B.T. to CRT socket.

"A" --- Insert Black lead
"B" --- Insert White lead



Tie focus and screen leads with BAND(L=100).

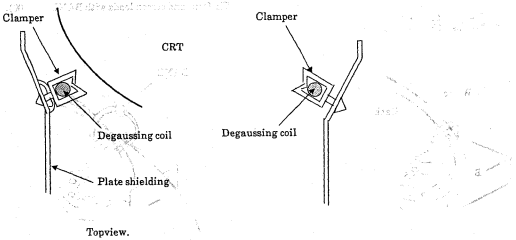




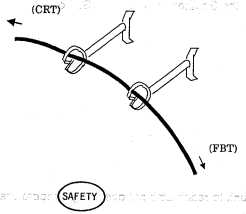
SAFETY

Insert DEGAUSS COIL to CLAMPER (symbol:144) on PLATE SHIELDING(R,B) and (L,B).

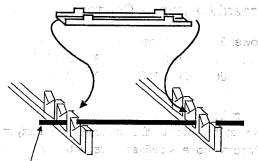
The reason that not to touch Degauss coil and Leaf,spring.



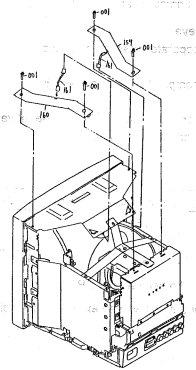
Clamp Anode Lead with CLAMPER on PLATE SHIELDING(L,B).



Mount PLATE,HOLDER to DEGAUSSING COIL HOLDER.



REMARK	SYMBOL



ADJUSTMENT PROCEDURES

Application

These specifications outline the adjustment procedures for Models JC-1744UMA/B/R 17 inch color monitor.

Model Name: JC-1744UMA/B/R

Destination: North America, Europe, Asia, and the Southern Hemisphere Standard Adjustment Conditions

Standard Adjustment Conditions

1. Power Supply Voltage

JC-1744UMA: AC 120 V±5% 60Hz

JC-1744UMB/R: AC 220 V±5% 50Hz

2. Warm Up

Adjust this monitor after a minimum of thirty minutes to allow unit to reach ambient operating temperature. Factory-mode is defined in items below.

3. Signals

Video : Analog 0.7±0.01 Vp-p Positive (terminated at 75 ohms ±1%)

or

Analog sync on green

Video 0.7±0.01 Vp-p positive

Sync 0.3±0.01 Vp-p negative

(terminated at 75 ohms ±1%)

Sync : TTL level

H/V separate, positive / negative

or

H/V composite, positive / negative

or

sync on green, 0.3±0.01 Vp-p negative

(terminated at 75 ohms ±1%)

4. Magnetic Fields

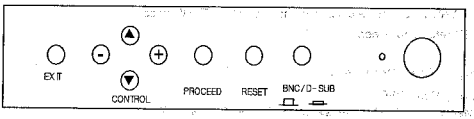
	Vertical Magnetic Fields	Horizontal Magnetic Fields
A Version B Version	35±1 μT	30±1 μT
R Version	-40±1 μT	30±1 μT

* Unless instructed otherwise, the CRT face should be facing to the east.

* Degauss the entire unit with an external degaussing coil for the adjustment.

5. OSM Menu Operation

5-1. Front Panel



5-2. OSM Menu

This unit is adjusted in an on screen menu by front panel key operation.

There are two types of on screen menu.

(1) Menu (user): This Menu can be operated by the customer.

(2) Menu (service): This Menu is hidden from the customer.

Hereafter, they will be called MENU(U) and MENU(S).

The menu can be displayed when the signal is input to the display unit.

5-3. Factory Mode

This unit has the MPU function which is called "Factory Mode".

In factory mode, there are two ON/OFF conditions.

ON: LED color is usually yellow.
Power Management function is non-operational.

OFF: LED color changes by an input condition of the sync signal.
When the sync signal is input to both the horizontal and vertical, LED color is green.
When the signal cable is disconnected from the signal generator, Power Management function operates.
It is not possible to enter MENU(S) by shortcut key.

Set the factory mode to the ON condition at adjustment time.
Set the factory mode to OFF at the time of adjustment end.

5-4. Factory Mode Setting

* Opening method of Menu is explained later.

5-4-1. Factory Mode OFF → ON

(1) Open Menu(U),TAB7) "DISPLAY MODE".

(2) Push and hold "RESET" SW and push "▲", "▼" SW at the same time.

(3) A "WARNING" will be displayed, then push "PROCEED" SW once.

(4) LED indicator light turn to Yellow from Green.

5-4-2. Factory Mode ON → OFF

(1) When OSM MENU is displayed, then push "EXIT" SW twice.
Otherwise, push "EXIT" SW once.

(2) A "WARNING" will be displayed, then push "EXIT" SW once.

(3) LED returns to Green.

5-5. Displaying the OSM (Open Menu)

5-5-1. Factory Mode OFF

Main Menu(U): Push either switch "EXIT", "+","-", "▲", "▼" once.

Main Menu(S): Open Menu(U) ,TAB7) "DISPLAY MODE".
Push and hold "RESET" SW and push "▲", "▼" SW at the same time.
A "WARNING" will be displayed, then push "PROCEED" SW once.

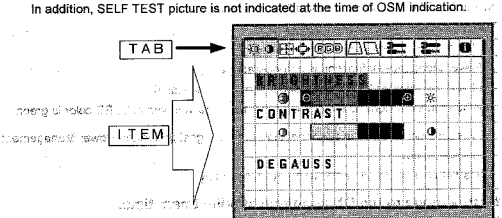
5-5-2. Factory Mode ON

Main Menu(U): Push either switch "+", "-", "▲", "▼" once.

Main Menu(S): Push "PROCEED" SW once.

5-5-3. Self Test

ON/OFF of Self Test pattern is alternated by Reset SW, when Factory Mode.
In addition, SELF TEST picture is not indicated at the time of OSM indication.



5-6. OSM Turn Off

* To Close the Menu

Push "EXIT" SW while Menu (U) or Menu (S) is displayed

While		
	TAB is highlighted	: One time.
	ITEM is highlighted	: Two times.
	entering SUB MENU	: Three times.

* To close MENU temporarily.

Push "PROCEED" SW once, while Menu (S) is being displayed.

Push "PROCEED" SW once more, Menu (S) is displayed again.

5-7. TAB, Item, Sub Menu Change

TAB to TAB	:	Push "-" SW or "+" SW.
TAB to item	:	Push "▲" SW or "▼" SW
Item to sub Menu	:	Push "PROCEED" SW once.
Item to item		Push "▲" SW or "▼" SW.
Sub Menu to item	:	Push "EXIT" SW once.
Item to TAB	:	When the item is the best step, push "▲" SW.
		When the item is the lowest step, push "▼" SW.
		Push "EXIT" all items.

5-8. To change Data Value

Data values are changed by pushing "-" or "+" SW.

5-9. To save Data Value

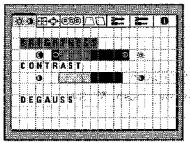
Data values are saved on EEPROM, when highlighted ITEM is changed.

6. Color Analyzer

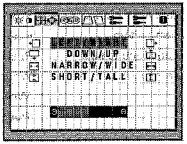
The color analyzer should be CA-100 (made by MINOLTA) or compatible.

7. Structure of OSM Menu (user)

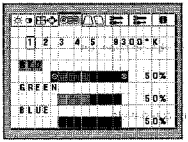
TAB 1) BRIGHTNESS & CONTRAST



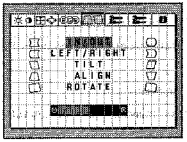
TAB 2) SIZE & POSITION



TAB 3) COLOR CONTROL



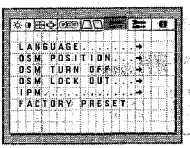
TAB 4) GEOMETRY



PRESET

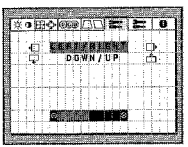
No.1 (9300° K) No.2 (7500° K)
No.3 (6500° K) No.4 (5000° K)
No.5 (4200° K)

TAB 5) TOOL

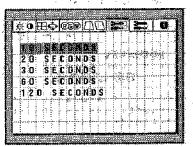


ITEM 5-1) LANGUAGE

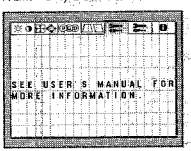
ITEM 5-2) OSM POSITION



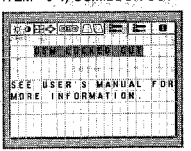
ITEM 5-3) OSM TURN OFF



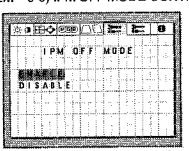
ITEM 5-4) OSM TURN OFF



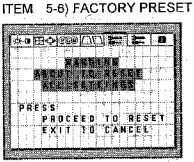
ITEM 5-4) OSM LOCK OUT



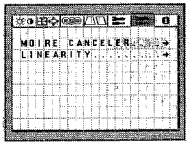
ITEM 5-5) IPM OFF MODE CONTROL FUNCTION



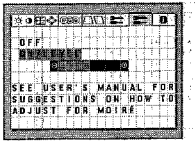
ITEM 5-6) FACTORY PRESET



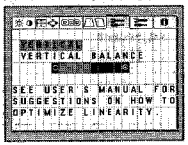
TAB 6) TOOL2



ITEM 6-1) MOIRE CANCELLER

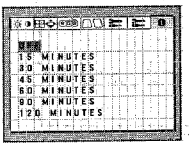


ITEM 6-2) LINEARITY

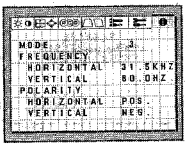


TAB 7) INFORMATION

ITEM 7-1) FITNESS TIPS

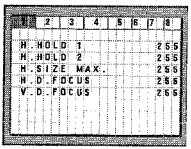


ITEM 7-2) DISPLAY MODE

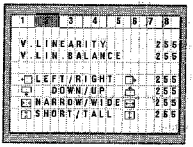


8. Structure of OSM Menu (service)

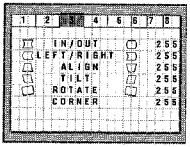
[TAB 1 (S)]



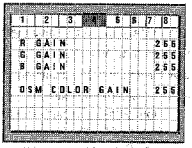
[TAB 2 (S)]



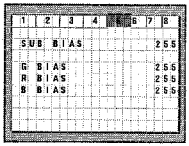
[TAB 3 (S)]



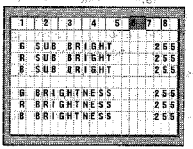
[TAB 4 (S)]



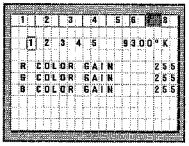
[TAB 5 (S)]



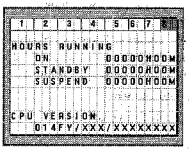
[TAB 6 (S)]



[TAB 7 (S)]



[TAB 8 (S)]



PRESET

No.1 (9300° K) No.2 (7500° K)
No.3 (6500° K) No.4 (5000° K)
No.5 (4200° K)

ADJUSTMENT ITEM

[A] SW.REG. Adjustment

1. Specifications
2. Adjustment Methods

[B] Pre-Adjustment

1. High-Voltage Adjustment

[C] Initial Settings

[D] Main Adjustment

1. Horizontal Hold Adjustment
2. Horizontal Raster Position
*3. Horizontal Maximum Size Adjustment
*4. Vertical Linearity Adjustment
5. Vertical Maximum Size Adjustment
*6. Deflection Distortion Adjustment
   - 6-1. Horizontal / Vertical Size Rough Adjustment
   - 6-2. Picture Tilt Adjustment
   - 6-3. Side Pincushion Balance Adjustment
   - 6-4. Side Pincushion Adjustment
   - 6-5. Trapezoid distortion Adjustment
   - 6-6. Corner Distortion Adjustment
   - 6-7. Parallelogram Distortion Adjustment
   - 6-8. Synthetic Distortion
*7. Preset Picture Size And Position Adjustment
8. Auto adjustment (use the alignment jig for good efficiency)

   *(As for step 3,4,6,7 , it can be substituted in step 8)
9. Video Amplitude Adjustment
   - 9-0. Settings
   - 9-1. Video Amplitude
   - 9-2. OSM Gain Adjustment
   - 9-3. Cut Off Adjustment
   - 9-4. Contrast Tracking Adjustment
   - 9-5. Brightness Tracking Adjustment
   - 9-6. Color Preset Adjustment
10. Focus Adjustment
11. CRT Purity Convergence

[E] Reference

1. Adjustment Signal
2. Timing of Adjustment Signal
3. Position of Connector / Test point of Adjustment

[A] Adjustment of SW.REG.

1. Specifications

1) Input voltage

A Version : AC 100V~120V

B/R Version : AC 220V~240V

2) Rated input voltage

A Version : AC 85V~132V

B/R Version : AC 170V~264V

3) Frequency 50 / 60Hz

4) Rated frequency 47Hz~63Hz

5) DC output

5-1) ON STATE MODE

	+200V	+80V	+15V
Maximum output curent	0.17A	0.46A	1.2A
Minimum output curent	0.05A	0.07A	0.64A
Range of voltage fluctuation	±5%	±1%	±5%

	+9.4V	-15V	+5V(floating)
Maximum output curent	0.62A	0.47A	0.33A
Minimum output curent	0.30A	0.29A	0A
Range of voltage fluctuation	±8%	±5%	±20%

2. Adjustment Methods

1) Adjustment conditions

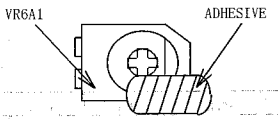
· Input voltage A/B/R Version : AC120V±5% 60Hz

· Load condition of adjustment

Output voltage	Output terminal	Load current	Load Resistance
+200V	K1-K4	0.17A	R1= 1176 Ω
+80V	K2-K4	0.46A	R2= 174 Ω
+15V	K3-K4	1.2A	R3= 12.5 Ω
-15V	K5-K4	0.47A	R4= 32 Ω
+9.4V	PM6-PM9	0.62A	R5= 15 Ω
+5V(floating)	CT1-CT3	0.33A	R6= 15 Ω

2) Adjustment procedure

① Connect a load and a pulse generator with each output of a power supply.
② Turn VR6A1 fully counterclockwise.
③ Set a DC power supply on +5V, and turn on a power switch.
④ Adjust a pulse to ON : 2uS, OFF : 19uS by turning volume of a pulse generator.
⑤ Turn on a power switch.
⑥ Adjust a voltage of V2 on +80V±0.05V by turning VR6A1 clockwise.
⑦ After adjustment , fixVR6A1 in an adhesive (TSE-385RTV or equality)



3) Connecting chart

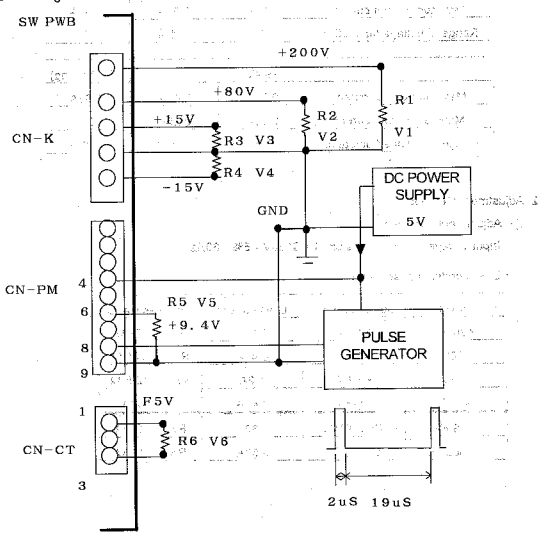


Fig.1 (R1~R6 : Electronic a resistant load or loar equipment

[B] Pre-Adjustment

1. High-Voltage Adjustment Signal 3 (VGA480) All Black

Initial Setting

SCREEN VR : Fully counterclockwise (MIN)

VR5R1 : Fully counterclockwise (MIN)

1) Receive signal 3.

2) Adjust VR5R1 slowly so that high voltage is 25kV±0.3kV.

After adjusting , seal VR5R1 with a silicon adhesive and cap (VR5R1).

[C] Initial Settings

1. Control Setting

Before adjusting, set the position of control as follows.

FBT	SCREEN VR	:Fully counterclockwise(MIN)
	FOCUS F1	:Mechanical center
	FOCUS F2	:Mechanical center
VR581		: Fully clockwise(MAX)
SW581		:CN-CT side
VR401		: Mechanical center

[D] Main Adjustment

Perform adjustment of CRT using this manual.

(1) Push "RESET" SW to reset a highlighted item.

(2) Close menu and turn the power off.

(3) Turn the monitor back on and confirm that the adjustment values / picture sizes / color temperrature / distortion values are the same before the Menu was closed.
(When "PROCEED" SW is pushed in Menu (S), OSM Menu will disappear.
If "PROCEED" SW is pushed once more, OSM displays)

1. Horizontal Hold Adjustment

Signal No.22 (HOLD-1 FH=31kHz) All White

No.26 (HOLD-2 FH=94kHz) All White

(1) Receive signal 22.

(2) Open Menu(S), TAB 1 "H.HOLD 1" and push "RESET" SW.(This is free run mode)

(3) Adjust SWs "+" and "-" so that there is one screen.

(4) Change Menu (S) "H.HOLD 1" to "H.HOLD 2" by "▼" SW.

(5) Receive signal 26.

(6) Open Menu(S), TAB 1 "H.HOLD 2" and push "RESET" SW.

(7) Adjust SWs "+" and "-" so that there is one screen.

(8) Push "▲" SW. (This is the normal screen)

(9) Receive signal 22.

(10) Check the screen that there is one image. If the screen is not stable, repeat steps (2) to (10).

2. Horizontal Raster Position

Signal: No.26 (HOLD_2) All Black

(1) Receive signal 26.

(2) Adjust SCREEN-VR on the FBT so that the back raster just appears.

(3) Make sure that set the position of control as follows.

VR581: Fully clockwise(MAX)

SW581: Set position to the CN-CT side

(4) Open Menu(S), TAB2 "NARROW/WIDE", Horizontal Size and adjust "+", "-" SW so that the horizontal size is 300±10 mm.

(5) If raster cannot be shifted to left per spec , SW581 is a position on the side of CN-CT.
If raster cannot be shifted to right per spec, SW581 is a position on the side of DEF PWB.

(6) Adjust VR581 so that the distance between the bezel and raster edge is as follows.

$| X_{Left} - X_{Right} | \leq 1.0$ mm

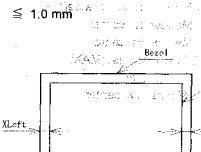


Fig 2-1 Horizontal Raster Centering

3. Horizontal Maximum Size Adjustment Signal 23 (H.MAX) All Green

(1) Receive signal 23.

(2) Open Menu(S), TAB2 "SHORT / TALL" and adjust "+", "-" SW so that the vertical size is 230 ±5mm.
If not able to set vertical size, adjust VR401 on the OSC PWB.

(3) Open Menu(S), TAB3 "IN / OUT" and adjust "+", "-" SW so that the side pincushion distortion.

(4) Open Menu(S), TAB1 "H.SIZE MAX" and make sure that "H.SIZE MAX" is set to 0.

(5) Open Menu(S), TAB2 "NARROW/WIDE" and adjust "+", SW so that the horizontal size is maximum.

(6) Open Menu(S), TAB1 "H.SIZE MAX" and adjust "+", "-" SW so that the horizontal size is 306 mm±2mm.

(7) Push "EXIT" SW.

4. Vertical Linearity Adjustment Signal: No. 25(V.MAX) All white
No. 21(1600*1200@75Hz) Cross hatch pattern

(1) Receive signal 25.
(2) Open Menu(S), TAB2 "SHORT / TALL" and adjust "+" SW so that the data to 255(MAX).
Adjust VR401 on the OSC PWB so that the vertical size is about 230mm.
(3) Receive signal 21.
(4) Open Menu(S), TAB2 "DOWN / UP" and adjust "+", "-" SW so that the picture is centered with in the raster.
(5) Open Menu(S), TAB2 "SHORT / TALL" and adjust "+", "-" SW so that the vertical size is 230 ±3mm.
If not able to set vertical size, adjust VR401 on the OSC PWB.
(6) Open Menu(S) TAB2 "V.LINEARITY" and adjust "+", "-" SW so that the vertical direction height of upper box and center box on the screen are equal.

Note: When a Menu is hidden temporarily for picture adjustment.
Push "PROCEED" SW once to display service Menu.
By pushing "PROCEED" SW once more, it returns to service Menu.

(7) Open Menu(S) TAB2 "V.LIN.BALANCE" and adjust "+", "-" SW so that vertical direction height of upper box and lower box on the screen are equal.
(8) Make sure that the linearity of upper, center, and lower on the screen are ±3% or less.
(9) Push "EXIT" SW.

5. Vertical Maximum Size Adjustment Signal: No. 25 (V.MAX) All white

(1) Receive signal 25.
(2) Open Menu(S), TAB2 "DOWN / UP" and adjust "+", "-" SW so that the picture is centered with in the raster.
(3) Open Menu(S), TAB2 "SHORT/TALL" and adjust "+", SW so that the data to 255(MAX).
(4) Adjust VR401 on the OSC PWB so that the vertical size is 230mm±2mm.

6. Deflection Distortion Adjustment

Note: Position CRT facing to east and degauss the monitor using an external degaussing coil.

6-0. Horizontal / Vertical Size Rough Adjustment

Signal: No. 15 (1024*768@75Hz) All white

(1) Open Menu(S), TAB2 "LEFT / RIGHT", "DOWN / UP", "NARROW / WIDE", "SHORT / TALL" and adjust the screen size to the following values.

Horizontal Size: 306mm±5mm
Vertical Size: 230mm±5mm

Note: Hide the OSM Menu when confirming the adjustments by pushing "PROCEED" key.

6-1. Picture Tilt Adjustment

Signal: No. 15 (1024*768@75Hz) Cross Hatch Pattern

(1) Receive signal 15.

(2) Turn the CRT face to east and degauss the monitor using an external degaussing coil.

(3) Make sure that the picture tilt meets the following standards.

$X \leq \pm 1.8$ mm

If out of specification, correct CRT assembly.

(4) Open Menu(S) TAB3 "ROTATE" and make sure that adjust "+", "-" SW so that the picture is tilted as follows.

"-" SW : counterclockwise

"+" SW : clockwise

(5) Open Menu(S) TAB3 "ROTATE" and adjust "+", "-" SW so that the picture tilt meets the following standards. The maximum correction is ± 1.0mm.

$X \leq \pm 0.8$ mm

(6) Push "EXIT" SW.

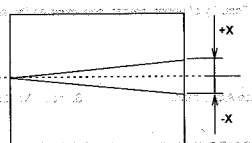


FIG 6-1 Picture Tilt

6-2. Side Pincushion Balance Adjustment

Signal: No. 15 (1024*768@75Hz) All white

(1) Open Menu(S), TAB3 "LEFT / RIGHT".
Adjust "+", "-" SW so that the left and right side pincushion difference distortion is equal (less than 1.0mm) to Xsl and Xsr.

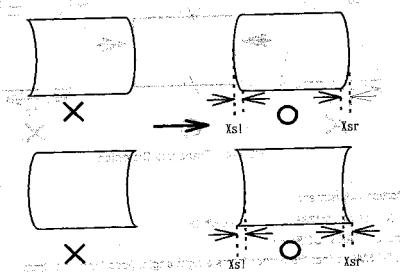


FIG 6-2 Side Pincushion Balance

6-3. Side Pincushion Adjustment

Signal: No. 15 (1024*768@75Hz) All white

(1) Open Menu(S), TAB3 "IN / OUT".
Adjust "+", "-" SW so that the left and right side pincushion distortion is straight line. (less than ±0.5mm)

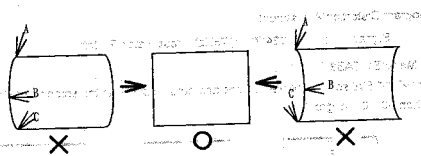


FIG 6-3 Side Pincushion

6-4. Trapezoid Distortion Adjustment

Signal: No. 15 (1024*768@75Hz) All white

(1) Open Menu(S), TAB3 "ALIGN".
Adjust "+","-" SW so that the Trapezoid Distortion is equal to X_{top} and X_{btm}. ($|X_{top}-X_{btm}| \leq 1.0mm$)

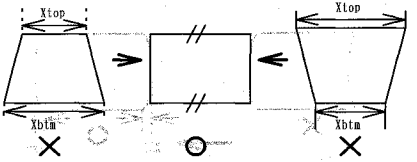


FIG 6-4 Trapezoid Distortion

6-5. Corner Distortion Adjustment

Signal: No. 15 (1024*768@75Hz) All white

(1) Open Menu(S), TAB3 "CORNER".
Adjust "+", "-" SW so that the corner forms a right angle. (less than $\pm$1.0mm)

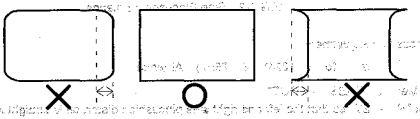


FIG 6-5 Corner Distortion

6-6. Parallelogram Distortion Adjustment

Signal: No. 15 (1024*768@75Hz) Cross Hatch Pattern

(1) Open Menu(S), TAB3 "TILT".
Adjust "+", "-" SW so that the vertical line and horizontal line at the screen's center fall at right angles. (less than 90 ± 0.5 degree)

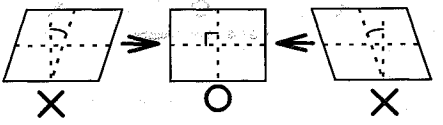


FIG 6-6 Parallelogram Distortion

6-7. Synthetic Distortion

Signal: No. 15 (1024*768@75Hz) All white

(1) Synthesize steps 6-1 to 6-6 and make sure that each step's standard is met.

(2) When undulating, correct within each step standard.

Undulation is a directional difference of tilt at either AC and CE or both.

Following figures (I) and (II) are example. AB and BC, CD and DE are the direction of tilt.

Undulated correction is the same direction of tilt at AB and BC, CD and DE.

Following figures (III) and (IV) are example. In that state, each standard must be met.

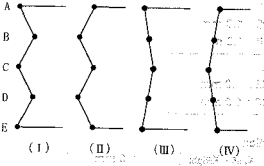


FIG 6-7 Undulated Definition

7. Preset Picture Size and Position Adjustment

Signal: No. 3 (VGA480) No.13 (800*600@85Hz)
No. 5 (MAC 640*480) No.15 (1024*768@75Hz)
No.11 (VESA 640*480@85Hz) * No.20 (1280*1024@75Hz)
No.12 (MAC 832*624) No.21 (1600*1200@75Hz)
Video: All White

(1) Receive signal 3.
(2) Open Menu(S), TAB2 "LEFT / RIGHT", "DOWN / UP", "NARROW / WIDE", "SHORT / TALL".
(3) Adjust the picture size and position as listed below by "+", "-" SW.

Picture size
H : 306±1.0 mm
V : 230±1.0 mm

* signal 20
H : 288±1.0 mm
V : 230±1.0 mm

Picture Position
H : $|X_{Left} - X_{Right}| \leqq 1.0$ mm
V : $|X_{top} - X_{Bottom}| \leqq 1.0$ mm

(4) Push "EXIT" SW.
(5) Receive the next signal and repeat steps (2) - (4).

Note: Before receiving the next signal, always push "EXIT" SW to store adjustments.

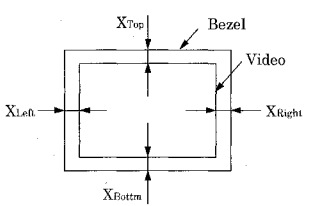


FIG 7-1 Picture Position

(6) In this signal , calculate the picture size and position from above adjustment data and write data in EEPROM.

Signal:		
	No. 1 (VGA350)	No. 9 (XGA)
	No. 2 (VGA400)	No.10 (VESA800*600 @75Hz)
	No. 4 (800*600@60Hz)	No.14 (1024*768@70Hz)
	No. 6 (VESA350 @85Hz)	*No.16 (1280*1024@60Hz)
	No. 7 (VESA400 @85Hz)	No.17 (Mac1152*870)
	No. 8 (VESA640*480 @75Hz)	No.18 (1024*768@70Hz)
		*No.19 (1280*1024@70Hz)

*	Signal 16,19	H : 288mm
		V : 230mm
	other signal	H : 306mm
		V : 230mm

8. Auto adjustment (use the adjustment jig for good efficiency)

A. Purpose of the procedure

Advantage to use this jig is as follows

① Shorten Adjustment Time

Adjustment of Display Size , Positioning and Distortion can be done within 2 minutes by using this jig (Normally it takes around 15 minutes.)

② All adjustment for Size , Position and Distortion can be done from P.C. by using this jig. Adjustment for Size and Position for all preset signal can be done by selecting only one specified signal (1024*768(75)).

③ Following Adjustment can be done automatically by using this jig.

(1) Horizontal Phase Adjustment
(2) Vertical position Adjustment
(3) Horizontal Size Adjustment
(4) Vertical Size Adjustment
(5) Trapezoid Distortion Adjustment

④ High level of skill for adjustment is not required.

B. Equipment for Adjustment

(1) AUTO ADJ I/F jig	1pc.
(2) ADJ Cable 15p-8p	1pc.
(3) ADJ Cable 8S-8S	1pc.
(4) The software for AUTO ADJ I/F jig	1pc.
(5) PC (IBM PC AT or Compatible)	1pc.
(6) Printer Cable	1pc.

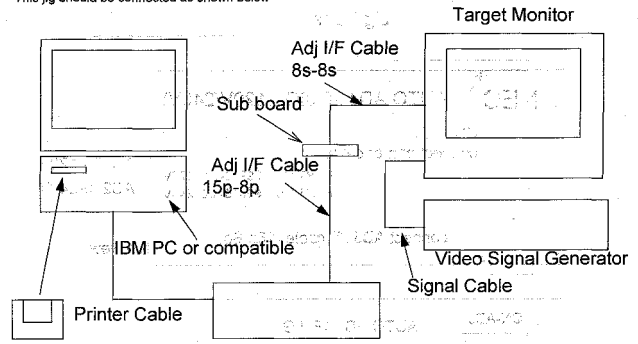
Note) items (5) and (6) should be prepared at your side

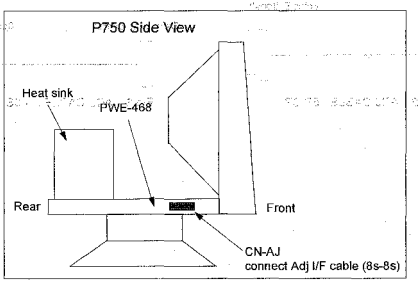
C. Operation

(1) Connection

1. Connect ADJ CABLE 15P-8P ("CN-ADJ") to AUTO ADJ I-F JIG.
2. Connect Printer Cable ("CN-PRN") to AUTO ADJ I/F JIG and PC.
3. Connect ADJ CABLE 8S-8S ("CN-AJ") to ADJ CABLE 15P-8P ("CN-ADJ") and CN-AJ of PWB of Monitor.

This jig should be connected as shown below





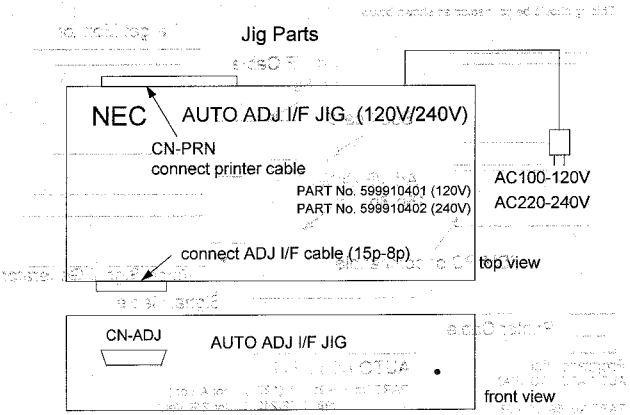


Fig 1 AUTO ADJ I/F JIG

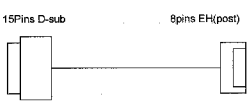


Fig 2 ADJ CABLE 15P-8P

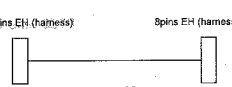


Fig 3 ADJ CABLE 8S-8S

(2) Operation

1. Insert FD of Software for AUTO ADJ I/F jig into PC.
2. Then Power on the PC , the AUTO ADJ I/F jig and Monitor.
3. In case of using model P750, use file "1744.bat".

(3) Adjustment Procedures

Following message will appear on Monitor Screen , when PC is turned on.

Size/Position Distortion Manual Adjust Program SPS.EXE Version 1.01

ROM READ ? (Y/N) or END (E) **MODEL:**

Y:INITIAL DATA=READING SET **JC-1744**
N:INITIAL DATA=PARAMETER FILE

When a key "Y" is pushed

PC begins to read the Data which is saved in EEPROM of Monitor , and begins to adjust the monitor using the read Data as a reference.

When a key "N" is pushed

PC begins to adjust the monitor according to the Data saved in PROGRAM/DISK as reference Data

Note) Push a key "N", when it is concluded that the Screen size and Positioning do not work well and the data is destroyed. Also push a key "N" , when it is not concluded.

When a key "E" is pushed.

PC ends adjustment procedure.

Adjustment procedure should be done based on Adjustment Procedure of Service Manual for each Model.

The following menu will appear on screen at the Start Menu , when a key "Y" or "N" is pushed.

1 : Size / Position
2 : Distortion
3 : USER INITIALIZE **[Start Menu]**
4 : END
No. ?

Meaning of the menu is as follows.

1 : Size / Position" : Adjustment of Size and Position
2 : Distortion" : Adjustment of Distortion
3 : USER INITIALIZE" : Enter Data of Size and Position to USER signal.
4 : END" : Return to initial menu.

Please follow the item below steps for the adjustment.

1. Distortion
   (If this item is adjusted after Vertical Size / Position is done in this item , Vertical Data may be possible change.)
2. H.SIZE(MAX)
3. Horizontal / Vertical Size and Position

(4) Distortion adjustment

In "Start Menu" message

When "2 : Distortion" is selected , following menu will be displayed on screen.

```
Distortion Adjust
1: ROTATION
2: PARALLELOGRAM
3: TRAPEZOID
4: PIN CUSHION
5: PIN CUSHION BALANCE
6: CORNER
7: V LINEAR
8: V LINEAR BALANCE
9: END
```

Then type "1" and push "ENTER" key to change signal of Signal Generator to 1024*768(75).

When No. "1" is selected, following will be displayed.

```
Distortion Adjust
1: ROTATION
2: PARALLELOGRAM
3: TRAPEZOID
4: PIN CUSHION
5: PIN-CUSHION BALANCE
6: CORNER
7: V.LINEAR
8: V.LINEAR BALANCE
9: END

        No. ?   3
DAC VALUE : 121
Decrease : 1(-1), 4(-5),7(-10)   Increase : 3(+1),6(+5),9(+10)   Original: 5
END(NO WRITE) : e E   END(WRITE) :ENTER
```

Each item is adjusted.

Function of Each key is as follows.

"1" : DAC value decreases by 1 (H. SIZE becomes smaller)
"4" : DAC value decreases by 5
"7" : DAC value decreases by 10

"3" : DAC value increases by 1 (H. SIZE expands)
"6" : DAC value increases by 5
"9" : DAC value increases by 10

"5" : Set up data value to reference value.

"e" or "E" : Ends without saving data.

"ENTER" : Ends after saved data.

(5) H.SIZE(MAX) Adjustment

In "Start Menu" message

When "1 : Size / Position" is selected , following menu will be displayed on screen.

```
1:VGA350                    JC-1744
2:VGA400                    SIZE/POSITION ADJUSTMENT
3:VGA480
4:800*600(60)
5:MAC2(640*480)
6:VESA350(85)
7:VESA400(85)
8:VESA640*480(75)
9:XGA
10:VESA800*600(75)
11:640*480(85)
12:MAC2(832*624)
13:800*600(85)              Select No.
14:1024*768(70)             No. ?
15:1024*768(75)
16:1280*1024(60)
17:MAC_1152
18:1024*768(85)
19:1280*1024(70)
20:1280*1024(75)
21:1600*1200(75)
23:H.SIZE(MAX)
80:TOTAL(1024*768(75))
82:END
                    No. ?
```

Then type "23" and push "ENTER" key to change signal of Signal Generator to H.SIZE(MAX).

When No. "23" is selected, following will be displayed.

```
Size/Position Adjust

SIGNAL : H.SIZE(MAX)
        1:H.POSI
        2:V.POSI
        3:H.SIZE
        4:V.SIZE
        5:H.SIZE(MAX)
        6:END

       No. ?
```

When No."3" is selected , following menu will be displayed.

```
Size/Position Adjust

        SIGNAL : H.SIZE(MAX)
        1:H.POSI
        2:V.POSI
        3:H.SIZE
        4:V.SIZE
        5:H.SIZE(MAX)
        6:END

        No. ?      3
        DAC VALUE : 126
Decrease : 1(-1), 4(-5),7(-10)    Increase : 3(+1),6(+5),9(+10)    Original: 5
END(NO WRITE) : e E       END(WRITE) :ENTER
```

Push key "5" to set up reference value. And then push one of key "3" or "6" or "9" to set up data to 255.

Note) If screen is over scanned by smaller value than 255 , push "ENTER" key to end "H.SIZE" adjustment.

Then select "5 : H.SIZE (MAX)" , decrease the Horizontal Size , and again set up data value to 255 at "H.SIZE" adjustment procedure.

In this case , be careful not to shrink horizontal size too small by "5 : H.SIZE (MAX)"

Push key "e" and return to menu of Size / Position , and select "5 : H.SIZE (MAX)".

And adjust horizontal size to 306mm.

Push key "ENTER" to ends the adjustment.

(6) Horizontal / Vertical Size and Position Adjustment

In "Start Menu" message

When "1 : Size / Position" is selected , following menu will be displayed on screen.

```
1:VGA350                    JC-1744
2:VGA400                    SIZE/POSITION ADJUSTMENT
3:VGA480
4:800*600(60)
5:MAC2(640*480)
6:VESA350(85)
7:VESA400(85)
8:VESA640*480(75)
9:XGA
10:VESA800*600(75)
11:640*480(85)
12:MAC2(832*624)
13:800*600(85)              Select No.
14:1024*768(70)             No.  ?
15:1024*768(75)
16:1280*1024(60)
17:MAC_1152
18:1024*768(85)
19:1280*1024(70)
20:1280*1024(75)
21:1600*1200(75)
23:H.SIZE(MAX)
80:TOTAL(1024*768(75))
82:END
```

Then type "80" and push "ENTER" key to change signal of Signal Generator to 1024*768(75).

When No. "80" is selected, following will be displayed.

```
Size/Position Adjust

SIGNAL :TOTAL(1024*768(75))
        1:H.POSI
        2:V.POSI
        3:H.SIZE
        4:V.SIZE

        6:END
       No. ?
```

Each item is adjusted.

(7) Supply signal from 1 to 21 and make sure that Size / Position, Distortion within a standard every each signal. As for out of the inspection standards, that signal should be adjusted again.

(Note)

This program be used IBM computers.

This program control IBM computer using the parallel port.

The I/O port of the parallel port be different by IBM computer types.

Open a parameter file and change value of a parallel port when if a program does not act.

(example)

Parallel port setting (Parameter file)

PRI_DATA_ADR 378

PRI_BUSY_ADR 379

When it is above-mentioned example, 378, an input port amount to 379 as for an output port of a parallel port.

D. Programming flow chart

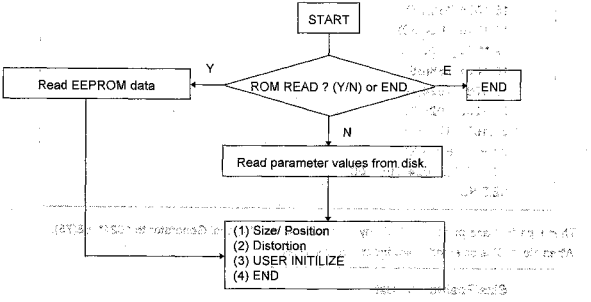


Fig 4 A start of service adjustment program

9. Video Amplitude Adjustment

9-0. Settings

(1) Confirm that the video signal of generator is as follows.
Video: Analog 0.7 Vp-p ± 0.01V p-p (terminated 75 ohms ±1%)
(2) Open Menu(S), TAB7 "1".
(3) Adjust "+" SW " so that the "R COLOR GAIN", "G COLOR GAIN",B COLOR GAIN" data are all 255.
(4) Open Menu(S), TAB6 "G SUB BRIGHT" and push "RESET" SW.
(5) Adjust "-" SW " so that the "G SUB BRIGHT", "R SUB BRIGHT", "B SUB BRIGHT" data are all 0.
(6) Open Menu(S), TAB6 "G BRIGHTNESS" and push "RESET" SW.
Adjust "+","-" SW " so that the "G BRIGHTNESS", "R BRIGHTNESS", "B BRIGHTNESS" data are all 127.
(7) Open Menu(S), TAB5.
(8) Adjust "-" SW " so that the "G BIAS", "R BIAS", "B BIAS" data are all 0.
(9) Open Menu(S), TAB4.
(10) Adjust "-" SW " so that the "R GAIN", "G GAIN", "B GAIN" data are all 0.
(11) Push "EXIT" SW.

9-1. Video Amplitude

Signal: No.24 (MAC 832*624) Window Pattern

(1) Receive the signal 24.
(2) Open Menu(S), TAB4.
(3) Adjust "+", "-" SW so that TP-R, TP-G,TP-B on the CRT PWB is set to 47Vp-p.(+1V/ -0V)
(4) Push "EXIT" SW.

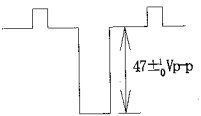


FIG 9-1 Wave form of RK,BK,BK

9-2. OSM Gain

Signal: No.24 (MAC 832*624) all black

(1) Receive signal 24.
(2) Open Menu(S), TAB4 "OSM COLOR GAIN".
(3) Adjust "+", "-" SW so that OSM video amplitude at TP-G on the CRT PWB is set to 40Vp-p.
(4) Push "EXIT" SW.

9-6. Color Preset

Signal: No.24 (MAC 832*624) Window Pattern
All Black

(1) Receive Signal 24(window pattern).

(2) Open Menu(S), TAB7 ,Color Preset No. "1 9300k ".

(3) Adjust "R COLOR GAIN", "G COLOR GAIN", "B COLOR GAIN" so that the color temperature is the following value.

x = 0.281±0.003
y = 0.311±0.003

(4) Receive Signal 24(All Black).

(5) Open Menu(S), TAB6 "G BRIGHTNESS" and push "RESET" SW.
Adjust " G BRIGHTNESS ", " R BRIGHTNESS ", " B BRIGHTNESS " so that the color temperature is the following value.

x = 0.281±0.003
y = 0.311±0.003

(6) Push "EXIT" SW.

(7) Open Menu(S), TAB7 ,and adjust Color Presets No.2 to 5 the following values.

PRESET No.	x	y
2	0.300±0.003	0.315±0.003
3	0.315±0.003	0.325±0.003
4	0.345±0.003	0.350±0.003
5	0.385±0.003	0.380±0.003

10. Focus Adjustment

Signal: No. 3 (VGA480) Cross Hatch Pattern
No. 15 (1024*768@75) "$" character Pattern
Cross Hatch Pattern

(1) Receive Signal 3 (Cross Hatch Pattern).

(2) Make sure that the screen size is as follows.

H : 306±2.5mm
V : 230±2.5mm

(3) Open Menu(s), TAB1.
Adjust the voltage at TP-DF on the DEF PWB to obtain the following values.
For the horizontal cycle voltage adjustment, use "H.D FOCUS".
For the vertical cycle voltage adjustment, use "V.D FOCUS".

Horizontal cycle : 340V±50Vp-p
Vertical cycle : 120V±30Vp-p

Note: When measuring Vp-p, use a 100:1 probe with capacitance of approx 2pF.

(4) Push "EXIT" SW.

(5) Open Menu(U), TAB1.
Adjust "CONTRAST" is MAX , and adjust "BRIGHTNESS" is the back raster just disappears.

(6) Adjust FOCUS VR F2 on the FBT to the thinnest vertical lines .

(7) Adjust FOCUS VR F1 on the FBT to the thinnest horizontal lines.

(8) Repeat steps (6) and (7) and adjust for uniform focus on the whole screen. Horizontal lines do not form halos.

(9) Receive Signal 15 ("$" character Pattern (7X9)).

(10) Make sure that the white "$" characters are crisp as possible.

(11) When the focus is not obtained in step (10) , fine adjust FOCUS VR F1 so that the whole screen is uniform.

(12) When the focus is not obtained in step (11) , fine adjust FOCUS VR F1 and F2 so that the whole screen is uniform.

(13) Receive Signal 15 (Cross Hatch Pattern) and make sure that R,G,B lines do not form halos.

(14) In above adjustment , when the focus is not uniform through out the screen , each parabolic wave should be corrected with in ±50V at the horizontal cycle and to ±30V at the vertical cycle. After corrections , perform steps (5) to (13) again.

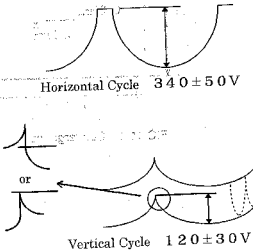


Fig 10-1 Dynamic Focus Wave Form

2. Timing of Adjustment Signal

TIMING NAME	1 VGA 350		2 VGA 400		3 VGA 480		4 800*600@60Hz		5 MAC 640*480	
Pixel Clock		25.175 [MHz]		25.175 [MHz]		25.175 [MHz]		40.000 [MHz]		30.240 [MHz]
H.Frequency		31.469 [kHz]		31.469 [kHz]		31.469 [kHz]		37.879 [kHz]		35.000 [kHz]
V.Frequency		70.086 [Hz]		70.086 [Hz]		59.940 [Hz]		60.317 [Hz]		66.667 [Hz]
H.Total Time	800 [dots]	31.778 [us]	800 [dots]	31.778 [us]	800 [dots]	31.778 [us]	1056 [dots]	26.400 [us]	864 [dots]	28.571 [us]
H.Addr Time	640 [dots]	25.422 [us]	640 [dots]	25.422 [us]	640 [dots]	25.422 [us]	800 [dots]	20.000 [us]	640 [dots]	21.164 [us]
H.Blank Time	160 [dots]	6.356 [us]	160 [dots]	6.356 [us]	160 [dots]	6.356 [us]	256 [dots]	6.400 [us]	224 [dots]	7.407 [us]
H.Front Porch	16 [dots]	0.636 [us]	16 [dots]	0.636 [us]	16 [dots]	0.636 [us]	40 [dots]	1.000 [us]	64 [dots]	2.116 [us]
H.Sync Time	96 [dots]	3.813 [us]	96 [dots]	3.813 [us]	96 [dots]	3.813 [us]	128 [dots]	3.200 [us]	64 [dots]	2.116 [us]
H.Back Porch	48 [dots]	1.907 [us]	48 [dots]	1.907 [us]	48 [dots]	1.907 [us]	88 [dots]	2.200 [us]	96 [dots]	3.175 [us]
V.Total Time	449 [lines]	14.269 [ms]	449 [lines]	14.268 [ms]	525 [lines]	16.683 [ms]	628 [lines]	16.579 [ms]	525 [lines]	15.000 [ms]
V.Addr Time	350 [lines]	11.122 [ms]	400 [lines]	12.711 [ms]	480 [lines]	15.253 [ms]	600 [lines]	15.840 [ms]	480 [lines]	13.714 [ms]
V.Blank Time	99 [lines]	3.146 [ms]	49 [lines]	1.557 [ms]	45 [lines]	1.430 [ms]	28 [lines]	0.739 [ms]	45 [lines]	1.286 [ms]
V.Front Porch	37 [lines]	1.176 [ms]	12 [lines]	0.381 [ms]	10 [lines]	0.318 [ms]	1 [lines]	0.026 [ms]	3 [lines]	0.086 [ms]
V.Sync Time	2 [lines]	0.064 [ms]	2 [lines]	0.064 [ms]	2 [lines]	0.064 [ms]	4 [lines]	0.106 [ms]	3 [lines]	0.086 [ms]
V.Back Porch	60 [lines]	1.907 [ms]	35 [lines]	1.112 [ms]	33 [lines]	1.049 [ms]	23 [lines]	0.607 [ms]	39 [lines]	1.114 [ms]
Scan Type		Non-Interlaced		Non-Interlaced		Non-Interlaced		Non-Interlaced		Non-Interlaced
H.Sync Polarity		Positive		Negative		Negative		Positive		Negative
V.Sync Polarity		Negative		Positive		Negative		Positive		Negative
		Separate		Separate		Separate		Separate		Sync on G

TIMING NAME	6 VESA 350@85Hz		7 VESA 400@85Hz		8 VESA 640*480@75Hz		9 XGA		10 VESA 800*600@75Hz	
Pixel Clock		31.500 [MHz]		31.500 [MHz]		31.500 [MHz]		44.900 [MHz]		49.500 [MHz]
H.Frequency		37.861 [kHz]		37.861 [kHz]		37.500 [kHz]		35.522 [kHz]		46.875 [kHz]
V.Frequency		85.080 [Hz]		85.080 [Hz]		75.000 [Hz]		87.064 [Hz]		75.000 [Hz]
H.Total Time	832 [dots]	26.413 [us]	832 [dots]	26.413 [us]	840 [dots]	26.667 [us]	1264 [dots]	28.161 [us]	1056 [dots]	21.333 [us]
H.Addr Time	640 [dots]	20.317 [us]	640 [dots]	20.317 [us]	640 [dots]	20.317 [us]	1024 [dots]	22.808 [us]	800 [dots]	16.162 [us]
H.Blank Time	192 [dots]	6.095 [us]	192 [dots]	6.095 [us]	200 [dots]	6.349 [us]	240 [dots]	5.345 [us]	256 [dots]	5.172 [us]
H.Front Porch	32 [dots]	1.016 [us]	32 [dots]	1.016 [us]	16 [dots]	0.508 [us]	8 [dots]	0.178 [us]	16 [dots]	0.323 [us]
H.Sync Time	32 [dots]	1.016 [us]	32 [dots]	1.016 [us]	64 [dots]	2.032 [us]	176 [dots]	3.920 [us]	80 [dots]	1.616 [us]
H.Back Porch	128 [dots]	4.063 [us]	128 [dots]	4.063 [us]	120 [dots]	3.810 [us]	56 [dots]	1.247 [us]	160 [dots]	3.232 [us]
V.Total Time	445 [lines]	11.754 [ms]	445 [lines]	11.754 [ms]	500 [lines]	13.333 [ms]	408 [lines]	11.488 [ms]	625 [lines]	13.333 [ms]
V.Addr Time	350 [lines]	9.244 [ms]	400 [lines]	10.565 [ms]	480 [lines]	12.800 [ms]	384 [lines]	10.810 [ms]	600 [lines]	12.800 [ms]
V.Blank Time	95 [lines]	2.509 [ms]	45 [lines]	1.189 [ms]	20 [lines]	0.533 [ms]	24 [lines]	0.676 [ms]	25 [lines]	0.533 [ms]
V.Front Porch	32 [lines]	0.845 [ms]	1 [lines]	0.026 [ms]	1 [lines]	0.027 [ms]	0 [lines]	0.000 [ms]	1 [lines]	0.021 [ms]
V.Sync Time	3 [lines]	0.079 [ms]	3 [lines]	0.079 [ms]	3 [lines]	0.080 [ms]	4 [lines]	0.113 [ms]	3 [lines]	0.064 [ms]
V.Back Porch	60 [lines]	1.585 [ms]	41 [lines]	1.083 [ms]	16 [lines]	0.427 [ms]	20 [lines]	0.563 [ms]	21 [lines]	0.448 [ms]
Scan Type		Non-Interlaced		Non-Interlaced		Non-Interlaced		Interlaced		Non-Interlaced
H.Sync Polarity		Positive		Negative		Negative		Positive		Positive
V.Sync Polarity		Negative		Positive		Negative		Positive		Positive
		Separate		Separate		Separate		Separate		Separate

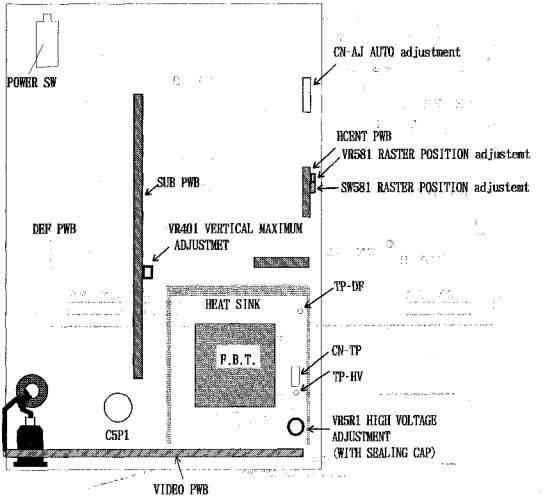
TIMING NAME	11 VESA 640*480@85Hz		12 MAC 832*624		13 800*600@85Hz		14 1024*768@70Hz		15 1024*768@75Hz	
Pixel Clock		36.000 [MHz]		57.283 [MHz]		56.250 [MHz]		75.000 [MHz]		78.750 [MHz]
H.Frequency		43.269 [kHz]		49.725 [kHz]		53.674 [kHz]		56.476 [kHz]		60.023 [kHz]
V.Frequency		85.008 [Hz]		74.550 [Hz]		85.061 [Hz]		70.069 [Hz]		75.029 [Hz]
H.Total Time	832 [dots]	23.111 [us]	1152 [dots]	20.111 [us]	1048 [dots]	18.631 [us]	1328 [dots]	17.707 [us]	1312 [dots]	16.660 [us]
H.Addr Time	640 [dots]	17.778 [us]	832 [dots]	14.524 [us]	800 [dots]	14.222 [us]	1024 [dots]	13.653 [us]	1024 [dots]	13.003 [us]
H.Blank Time	192 [dots]	5.333 [us]	320 [dots]	5.586 [us]	248 [dots]	4.409 [us]	304 [dots]	4.053 [us]	288 [dots]	3.657 [us]
H.Front Porch	32 [dots]	0.889 [us]	32 [dots]	0.559 [us]	32 [dots]	0.569 [us]	24 [dots]	0.320 [us]	16 [dots]	0.203 [us]
H.Sync Time	48 [dots]	1.333 [us]	64 [dots]	1.117 [us]	64 [dots]	1.138 [us]	136 [dots]	1.813 [us]	96 [dots]	1.219 [us]
H.Back Porch	112 [dots]	3.111 [us]	224 [dots]	3.910 [us]	152 [dots]	2.702 [us]	144 [dots]	1.920 [us]	176 [dots]	2.235 [us]
V.Total Time	509 [lines]	11.764 [ms]	667 [lines]	13.414 [ms]	631 [lines]	11.756 [ms]	806 [lines]	14.272 [ms]	800 [lines]	13.328 [ms]
V.Addr Time	480 [lines]	11.093 [ms]	624 [lines]	12.549 [ms]	600 [lines]	11.179 [ms]	768 [lines]	13.599 [ms]	768 [lines]	12.795 [ms]
V.Blank Time	29 [lines]	0.670 [ms]	43 [lines]	0.865 [ms]	31 [lines]	0.578 [ms]	38 [lines]	0.673 [ms]	32 [lines]	0.533 [ms]
V.Front Porch	1 [lines]	0.023 [ms]	1 [lines]	0.020 [ms]	1 [lines]	0.019 [ms]	3 [lines]	0.053 [ms]	1 [lines]	0.017 [ms]
V.Sync Time	3 [lines]	0.069 [ms]	3 [lines]	0.060 [ms]	3 [lines]	0.056 [ms]	6 [lines]	0.106 [ms]	3 [lines]	0.050 [ms]
V.Back Porch	25 [lines]	0.578 [ms]	39 [lines]	0.784 [ms]	27 [lines]	0.503 [ms]	29 [lines]	0.513 [ms]	28 [lines]	0.466 [ms]
Scan Type	Non-Interlaced		Non-Interlaced		Non-Interlaced		Non-Interlaced		Non-Interlaced	
H.Sync Polarity	Negative		Negative		Positive		Negative		Positive	
V.Sync Polarity	Negative		Negative		Positive		Negative		Positive	
	Separate		Sync on G		Separate		Separate		Separate	

TIMING NAME	16 1280*1024@60Hz		17 MAC 1152*870		18 1024*768@85Hz		19 1280*1024@70Hz		20 1280*1024@75Hz	
Pixel Clock		108.000 [MHz]		100.000 [MHz]		94.500 [MHz]		127.000 [MHz]		135.000 [MHz]
H.Frequency		63.981 [kHz]		66.681 [kHz]		68.677 [kHz]		74.910 [kHz]		79.976 [kHz]
V.Frequency		60.020 [Hz]		75.062 [Hz]		84.997 [Hz]		69.880 [Hz]		75.025 [Hz]
H.Total Time	1688 [dots]	15.630 [us]	1456 [dots]	14.560 [us]	1376 [dots]	14.561 [us]	1696 [dots]	13.350 [us]	1688 [dots]	12.504 [us]
H.Addr Time	1280 [dots]	11.852 [us]	1152 [dots]	11.520 [us]	1024 [dots]	10.836 [us]	1280 [dots]	10.080 [us]	1280 [dots]	9.481 [us]
H.Blank Time	408 [dots]	3.778 [us]	304 [dots]	3.040 [us]	352 [dots]	3.725 [us]	416 [dots]	3.270 [us]	408 [dots]	3.022 [us]
H.Front Porch	48 [dots]	0.444 [us]	32 [dots]	0.320 [us]	48 [dots]	0.508 [us]	32 [dots]	0.250 [us]	16 [dots]	0.119 [us]
H.Sync Time	112 [dots]	1.037 [us]	128 [dots]	1.280 [us]	96 [dots]	1.016 [us]	160 [dots]	1.260 [us]	144 [dots]	1.067 [us]
H.Back Porch	248 [dots]	2.296 [us]	144 [dots]	1.440 [us]	208 [dots]	2.201 [us]	224 [dots]	1.760 [us]	248 [dots]	1.837 [us]
V.Total Time	1066 [lines]	16.661 [ms]	915 [lines]	13.322 [ms]	808 [lines]	11.765 [ms]	1072 [lines]	14.310 [ms]	1066 [lines]	13.329 [ms]
V.Addr Time	1024 [lines]	16.005 [ms]	870 [lines]	12.667 [ms]	768 [lines]	11.183 [ms]	1024 [lines]	13.670 [ms]	1024 [lines]	12.804 [ms]
V.Blank Time	42 [lines]	0.656 [ms]	45 [lines]	0.655 [ms]	40 [lines]	0.582 [ms]	48 [lines]	0.640 [ms]	42 [lines]	0.525 [ms]
V.Front Porch	1 [lines]	0.016 [ms]	3 [lines]	0.044 [ms]	1 [lines]	0.015 [ms]	2 [lines]	0.026 [ms]	1 [lines]	0.013 [ms]
V.Sync Time	3 [lines]	0.047 [ms]	3 [lines]	0.044 [ms]	3 [lines]	0.044 [ms]	4 [lines]	0.053 [ms]	3 [lines]	0.038 [ms]
V.Back Porch	38 [lines]	0.594 [ms]	39 [lines]	0.568 [ms]	36 [lines]	0.524 [ms]	42 [lines]	0.561 [ms]	38 [lines]	0.475 [ms]
Scan Type	Non-Interlaced		Non-Interlaced		Non-Interlaced		Non-Interlaced		Non-Interlaced	
H.Sync Polarity	Positive		Negative		Positive		Negative		Positive	
V.Sync Polarity	Positive		Negative		Positive		Negative		Positive	
	Separate		Sync on G		Separate		Sync on G		Separate	

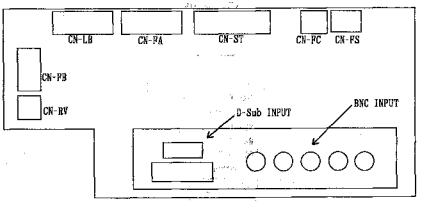
TIMING NAME	21 1600*1200@75Hz		22 H.HOLD1		23 H.MAX		24 MAC-832(Window)		25 V.MAX	
Pixel Clock		202.500 [MHz]		27.900 [MHz]		30.240 [MHz]		57.283 [MHz]		84.500 [MHz]
H.Frequency		93.750 [kHz]		31.000 [kHz]		35.000 [kHz]		49.720 [kHz]		65.000 [kHz]
V.Frequency		75.000 [Hz]		59.048 [Hz]		66.667 [Hz]		74.550 [Hz]		80.65 [Hz]
H.Total Time	2160 [dots]	10.667 [us]	900 [dots]	32.260 [us]	864 [dots]	28.571 [us]	1152 [dots]	20.110 [us]	1300 [dots]	15.38 [us]
H.Addr Time	1600 [dots]	7.901 [us]	720 [dots]	25.810 [us]	614 [dots]	20.238 [us]	241 [dots]	4.207 [us]	1024 [dots]	12.12 [us]
H.Blank Time	560 [dots]	2.765 [us]	180 [dots]	6.450 [us]	252 [dots]	8.333 [us]	911 [dots]	15.903 [us]	276 [dots]	3.26 [us]
H.Front Porch	64 [dots]	0.316 [us]	18 [dots]	0.640 [us]	78 [dots]	2.579 [us]	327 [dots]	5.708 [us]	24 [dots]	0.28 [us]
H.Sync Time	192 [dots]	0.948 [us]	108 [dots]	3.870 [us]	64 [dots]	2.116 [us]	64 [dots]	1.117 [us]	92 [dots]	1.09 [us]
H.Back Porch	304 [dots]	1.501 [us]	54 [dots]	1.940 [us]	110 [dots]	3.638 [us]	520 [dots]	9.078 [us]	160 [dots]	1.89 [us]
V.Total Time	1250 [lines]	13.333 [ms]	525 [lines]	16.935 [ms]	525 [lines]	15.000 [ms]	667 [lines]	13.414 [ms]	806 [lines]	12.4 [ms]
V.Addr Time	1200 [lines]	12.800 [ms]	389 [lines]	12.548 [ms]	480 [lines]	13.714 [ms]	221 [lines]	4.444 [ms]	596 [lines]	9.169 [ms]
V.Blank Time	50 [lines]	0.533 [ms]	136 [lines]	4.387 [ms]	45 [lines]	1.286 [ms]	446 [lines]	8.970 [ms]	210 [lines]	3.231 [ms]
V.Front Porch	1 [lines]	0.011 [ms]	52 [lines]	1.677 [ms]	3 [lines]	0.086 [ms]	203 [lines]	4.083 [ms]	89 [lines]	1.343 [ms]
V.Sync Time	3 [lines]	0.032 [ms]	2 [lines]	0.065 [ms]	3 [lines]	0.086 [ms]	3 [lines]	0.060 [ms]	6 [lines]	0.092 [ms]
V.Back Porch	46 [lines]	0.491 [ms]	82 [lines]	2.645 [ms]	39 [lines]	1.114 [ms]	240 [lines]	4.827 [ms]	115 [lines]	1.769 [ms]
Scan Type		Non-Interlaced		Non-Interlaced		Non-Interlaced		Non-Interlaced		Non-Interlaced
H.Sync Polarity		Positive		Positive		Negative		Negative		Negative
V.Sync Polarity		Positive		Positive		Negative		Negative		Negative
		Separate		Composit		Separate		Sync on G		Separate

TIMING NAME	26 H.HOLD2		27 EDID							
Pixel Clock		203.646 [MHz]		28.322 [MHz]		[MHz]		[MHz]		[MHz]
H.Frequency		94.000 [kHz]		31.463 [kHz]		[kHz]		[kHz]		[kHz]
V.Frequency		75.199 [Hz]		42.01 [Hz]		[Hz]		[Hz]		[Hz]
H.Total Time	2160 [dots]	10.838 [us]	900 [dots]	31.777 [us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Addr Time	1600 [dots]	7.880 [us]	720 [dots]	25.422 [us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Blank Time	560 [dots]	2.758 [us]	180 [dots]	6.36 [us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Front Porch	64 [dots]	0.315 [us]	18 [dots]	0.636 [us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Sync Time	192 [dots]	0.946 [us]	108 [dots]	3.813 [us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Back Porch	304 [dots]	1.497 [us]	54 [dots]	1.907 [us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
V.Total Time	1250 [lines]	13.298 [ms]	749 [lines]	23.8 [ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Addr Time	1200 [lines]	12.766 [ms]	685 [lines]	21.767 [ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Blank Time	50 [lines]	0.532 [ms]	64 [lines]	2.034 [ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Front Porch	1 [lines]	0.011 [ms]	14 [lines]	0.445 [ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Sync Time	3 [lines]	0.032 [ms]	3 [lines]	0.095 [ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Back Porch	46 [lines]	0.489 [ms]	47 [lines]	1.494 [ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
Scan Type		Non-Interlaced		Non-Interlaced						
H.Sync Polarity		Positive		Negative						
V.Sync Polarity		Positive		Negative						
		Separate		Separate						

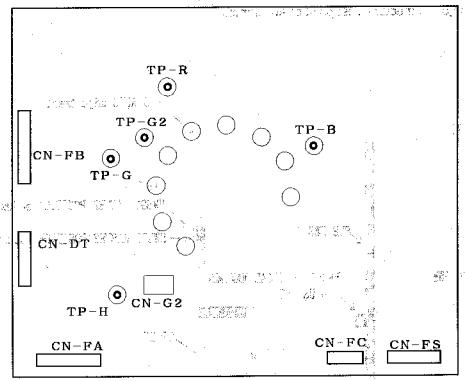
2. Position of Connector / Test point of Adjustment



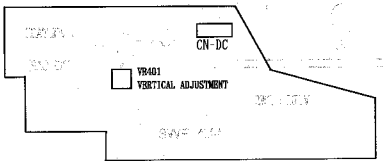
MAIN PWB



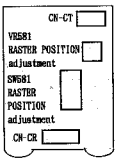
VIDEO PWB



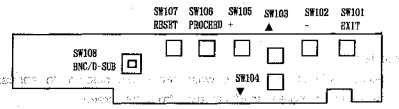
CRT PWB



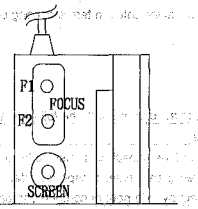
OSC PWB



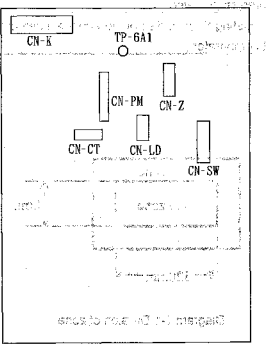
HCENT PWB



CONT PWB



F.B.T. VR



SW MAIN PWB

INSPECTION

1. CRT

1-1. Inspection condition

I) Inspection shall be made for each color of white, red, green, blue and for appearance.

ii) Inspection shall be made more than 60 cm away from the screen.

iii) The ambient brightness must be less than 5 lm/m², and in the non-operating condition, the screen may be viewed under white light of 700 to 1000 lm/m² at the tube face.

iv) The division of zone is shown in Diagram 1-1.

v) Equivalent diameter of defect is indicated in terms of (long dia. + short dia.)/2.

1-2. Phosphor quality

Phosphor quality classify in accordance with the following table.

Contrast	Defect types
High contrast	50% or more of the phosphor is missing by clogging, or missing red,green, blue phosphor or dark dot and so on, High contrast defect by judgment of contrast comparator.
Middle contrast	25% to less than 50% of the phosphor missing by clogging,or missing red, green, blue phosphor , or dark dot and so on, middle contrast defect by judgment of contrast comparator. Discolored stripe defect.
Low contrast	Irregular coating,Stain and so on, low contrast defect by judgment of contrast comparator.

1-3. Division of zone

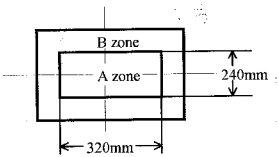


Diagram 1-1 Division of zone

1-4. Limits

(1) High contrast defect

	Type of defect	Allowable number [pcs]			Minimum Separation [mm]		
		A Zone	B Zone	SUM	A Zone	B Zone	SUM
A	1 Trio (75%or more)	1	1	1	30	20	30
B	1 Trio (50□ less than 75%)	2	2	2	30	20	30
C	A+B	2	2	2	30	20	30
D	3 or more missing adjacent stripes of same color	0	1	1	50	20	50
E	2 missing adjacent stripes of same color	1	2	3			
F	2 missing adjacent stripes of different color	1	2	3			
G	1 missing stripe	6 each color	8 each color	8			

(2) Middle contrast defect

Type of defect	Allowable number [pcs]			Minimum Separation [mm]
	A Zone	B Zone	SUM	
3 adjacent stripe	2	3	3	20
2 adjacent stripe	4	6	6	20
1 stripe	Unlimited (provided it isn't crowded.)			

(3) Low contrast defect

A Zone	Equivalent diameter of gathering of low contrast defect shall not exceed 13mm.
A fault in B Zone and also on the edge of A Zone	Equivalent diameter of gathering of low contrast defect shall not exceed 50mm.

(4) CRT face plate defect

valve defect

	Blisters [mm]	Opaque spots and closed Blisters[mm]	Allowable number			Minimum separation[mm]
			A Zone	B Zone	SUM	
Defect in a Φ50mm	0.25~0.40	0.20~0.60	2	2	2	12.7
Large fault	0.41~0.60	0.41~0.60	1	1	2	57
	0.61~	0.61~	0	0	0	—

elongated closed blisters

	A Zone	B Zone
Width [mm]	0.10~0.20	0.10~0.30
Maximum length [mm]	4	6

(5) Scratches

(A scratch of depth formed linearly from other object.)

Width [mm]	Allowable Length of a scratch [mm]
More than 0.10	Rejected
0.05 to 0.09	Not more than 38mm
Less than 0.05	4

If the scratch can catch the edge of a nail, then it is to be rejected.

Note : 1-4. (6) , (7) for A ,R Ver.

(6) AR coating defect (stain, coating peeled, etc.)

Equivalent Dia of Blemishes [mm]	Max.Allowable Number		Min.Allowable Separation [mm]
	Zone A	Zone B	
0.91 ~ 1.50	5	-	40
less than 0.91	unlimited		-

(7) AR coating's surface wound (Scratches)

Width [mm]	Allowable Length [mm]
More than 0.16	rejected
0.11 ~ 0.15	20
less than 0.11	unlimited

1-5. Reflected color

The reflected color at center of screen shall be between the two limit samples (red limit, blue limit).

Inspection condition

I) The fluorescent lamp shall be placed at back above of inspector.

ii) Compare the reflected color at the screen center of mass-production line set with the limit samples.

The angle between light from lighting source and reflected light shall be as small as possible.

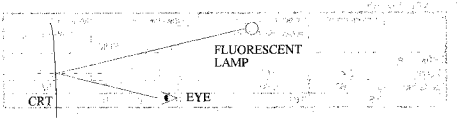


Fig.1-2 Reflected color

1-6. Coating Blemishes (For B ver.)

① High contrast

Size of Defects (mm)	Max. Allowable Number	Min. Allowable Separation (mm)
0.25 or less	not gathering stain	
0.26 ~ 0.50	Max. 5 pcs in 50 mm diameter	
0.51 ~ 1.0	5	40
1.01 ~ 1.5	3	60
1.51 or more	0	-

②Low contrast

Size of defects (mm)	Max. Allowable Number	Min. Allowable Separation (mm)
1.0 or less	not gathering stain	
1.01 ~ 2.5	5	40
2.51 or more	0	-

③ Unevenly reflection defect

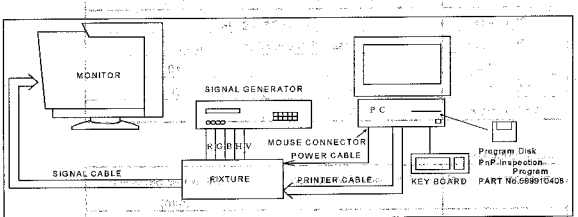
Size of defects (mm)		Max. Allowable Number	Min. Allowable Separation (mm)
Width	Length		
5.0 or more	3.0 ~ 7.0	3	40
	7.1 or more	0	-

High Contrast ····· Defects of reflection which are clearly bright
Low Contrast ····· Unevenly concentric reflex
Unevenly reflex defect ··· Unevenly radial reflex from the center of screen

2. Inspection of PnP communication and Writing EDID to EEPROM and inspection of PnP communication

2-1. A construction of System

This system is connected as shown below.



2-2. Starting method

1) Input Signal

Input signal must be separate sync and two kinds of signals must be prepared.

One is the signal with vertical syncronization frequency of 42Hz, and another is the signal with vertical syncronization frequency of between 55Hz and 25kHz. Horizontal syncronization frequency should be set to reasonable value(example 31.5kHz).

2) Power ON procedure

·Power on PC and put the floppy disk for PnP Inspection into PC.

·Turn on Fixture.

·Make sure that fixture's LED flashes on and off.

·Turn on signal generator and monitor.

3) Starting PC Software

·Inspection of PnP communication

To check the PnP communication for P750, EDID file name is P750.

Type "P P750" on DOS command line and press return key.

·Writing EDID to EEPROM and inspection of PnP communication

To write EDID to EEPROM and check the PnP communication of P750, type "WP P750" on DOS command line and press return key.

2-3. Operation

·The operation should be performed according to the screen message.

·When the message of "Please input Serial Number." is displayed, type a serial number and hit return key.

The message of "Input Serial Number is OK ?" is displayed. If the serial number is correct, press Y key, otherwise press N key and input the correct serial number.

If you pressed Y key, the EDID data in which the serial number was editted is displayed. Check the data and press N key.

·When the message of "Please set Vsync to 42Hz." is displayed, set the signal generator to the signal with the vertical syncronization frequency of 42Hz. When the message of "Please set Vsync to over 55Hz." is displayed, set the signal generator to the signal with vertical syncronization frequency of between 55Hz and 25kHz.

·The message of "Normally Complete" means that the writing EDID data or PnP inspection was completed normally. "Error" message means that the writing EDID data or PnP inspection did not process correctly.

·When the PnP inspection is complete EDID data would be displayed and if the read EDID data differ from the original EDID data, the different bytes would be displayed in red.

·For the details of error messeges, see the message displayed at the bottom right on the screen. The explanations of the messages are shown on section 4.

·After writing EDID data or inspection of DDC2B, monitor can not be communicated by DDC1. In this case, turn the monitor off and on. The DDC1 communication check can be performed again.

·Make sure that fixture's LED flashes on and off before writing EDID data and inspecting DDC1 and DDC2B. If the fixture's LED does not flash on and off, turn the monitor and the fixture off and then power them on again.

2-4. Error Messages

·**Start Bit Error**

This message is displayed when the start bit is not "H" while sending data from PC to MPU on the fixture.

This error will be caused by noise etc. on the line.

·**Command Error**

This message is displayed when the different command is sent from PC to MPU on the fixture.

·**Hardware Error**

This message means that the PC didn't recognize ACK command sent from the MPU on the fixture.

·**File Open Error**

This message means that the input EDID file name is wrong.

·**Command line Switch Error**

This message means that the input communication command is wrong.

·Parity Error

This message is displayed when the MPU on the fixture recognized that the parity bit is incorrect. This error will be caused by noise etc. on the line.

·EDID Data Error

This message is displayed when the null bit was not detected in EDID data read by DDC1 communication.

·EDID Data Sort Error

This message is displayed when the header code was not detected in EDID data read by DDC1 communication.

·Time Out Error

This message is displayed when the PC did not recognize ACK commands sent from MPU within 10 msec after PC had sent communication command or EDID data.

If this error occured, check the connection on PC, fixture, and monitor.

·Data length is too short

This message is displayed when the input serial number is in complete.

·Data length is too long

This message is displayed when the input serial number has excessive numbers or letters.

2-5. EDID data file

An example of the EDID data file text is shown below. When you write or inspect EDID for a new monitor model that does not have a data file, create its data file according to the format shown below by using an editor software and save the file in an appropriate name to the floppy disk for PnP Inspection.

EDID-047

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	38	A3	20	44	01	01	01	01
10	22	06	01	01	0C	20	18	78	EB	A0	B2	A2	54	4C	9B	26
20	10	48	4F	FF	FF	80	31	59	45	59	61	59	71	4F	81	59
30	81	59	A9	4F	01	01	1A	4F	40	30	62	B0	32	40	40	00
40	13	00	32	E6	10	00	00	1E	00	00	00	FD	00	37	A0	1F
50	5E	15	00	0A	20	20	20	20	20	20	00	00	00	FC	00	4E
60	45	43	20	50	37	35	30	0A	20	20	20	20	00	09	00	FF
70	00	36	38	30	30	30	30	31	4B	41	0A	20	20	20	00	49

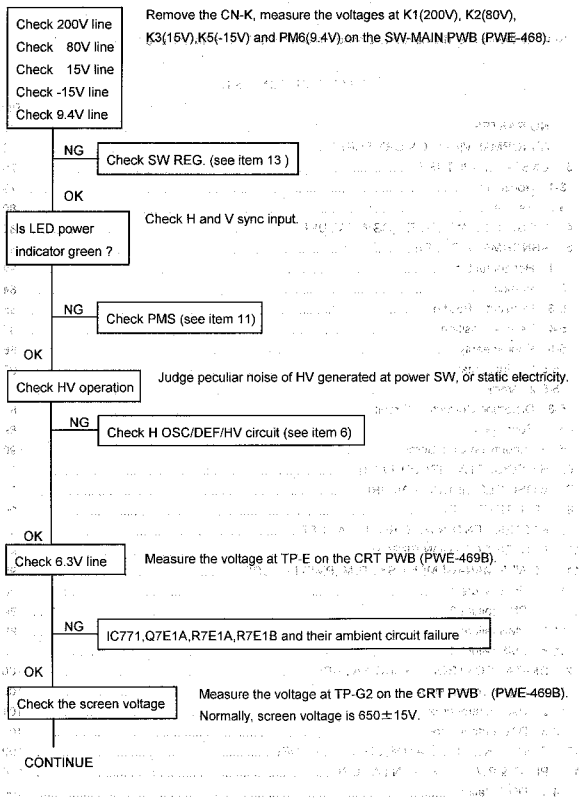
TROUBLE SHOOTING

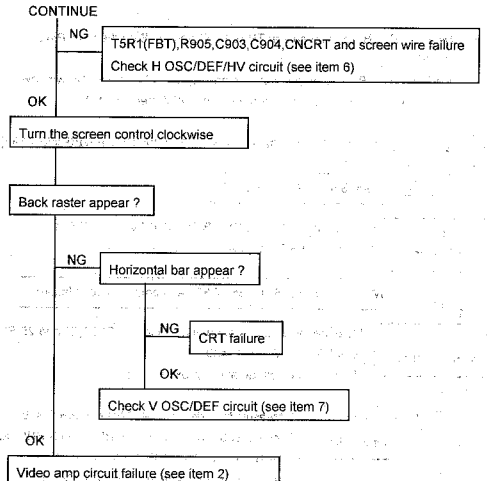
Refer to the User's Manual trouble shooting section before using this chart.

TABLE OF CONTENTS

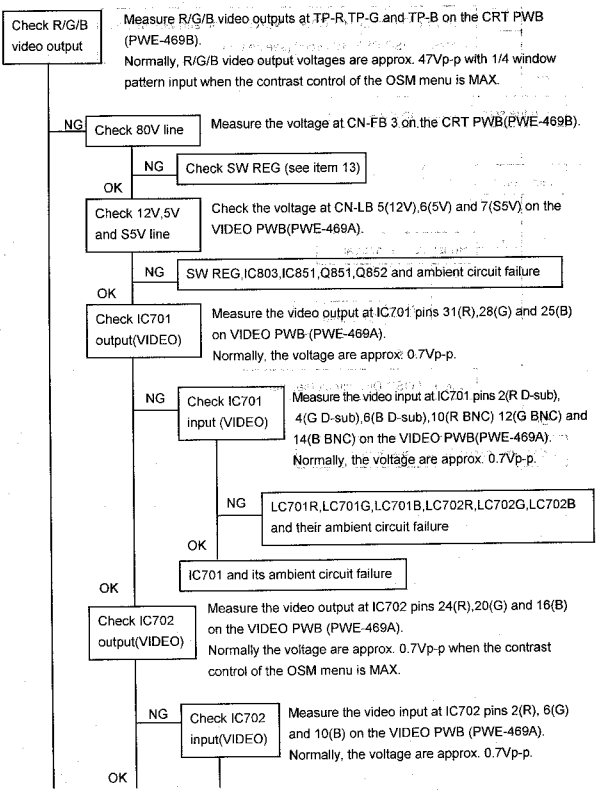
	Page
1. NO RASTER	70
2. ABNORMAL VIDEO ON CRT SCREEN	72
3. UNSTABLE PICTURE	79
3-1 Horizontal	79
3-2 Vertical	80
4. ON SCREEN MANAGER (OSM) FAILURE	81
5. ABNORMAL PICTURE	82
5-1 Horizontal Size	82
5-2 Vertical Size	84
5-3 Horizontal Position	85
5-4 Vertical Position	85
5-5 Poor linearity	86
5-5-1 Horizontal	86
5-5-2 Vertical	86
5-6 Distortion Correction Circuit	87
5-7 Poor Focus	89
5-8 Impurity on CRT Screen	90
6. H OSC/DEF/HV CIRCUIT FAILURE	91
7. V OSC/DEF CIRCUIT FAILURE	95
8. SELF TEST ERROR	96
9. RASTER CENTERING CIRCUIT FAILURE	97
10. RASTER ROTATION ERROR	97
11. POWER MANAGEMENT SYSTEM (PMS) FAILURE	98
11-1 PMS failure 1	98
11-2 PMS failure 2	99
11-3 PMS failure 3	99
11-4 PMS failure 4	99
12. DIGITAL CONTROL CIRCUIT FAILURE	100
12-1 Digital control error	100
12-2 User control error	101
12-3 DAC output error	101
13. SWITCHING REGULATOR CIRCUIT FAILURE	102
14. PLUG & PLAY FUNCTION FAILURE	104
14-1 DDC1 failure	104
14-2 DDC2B failure	104

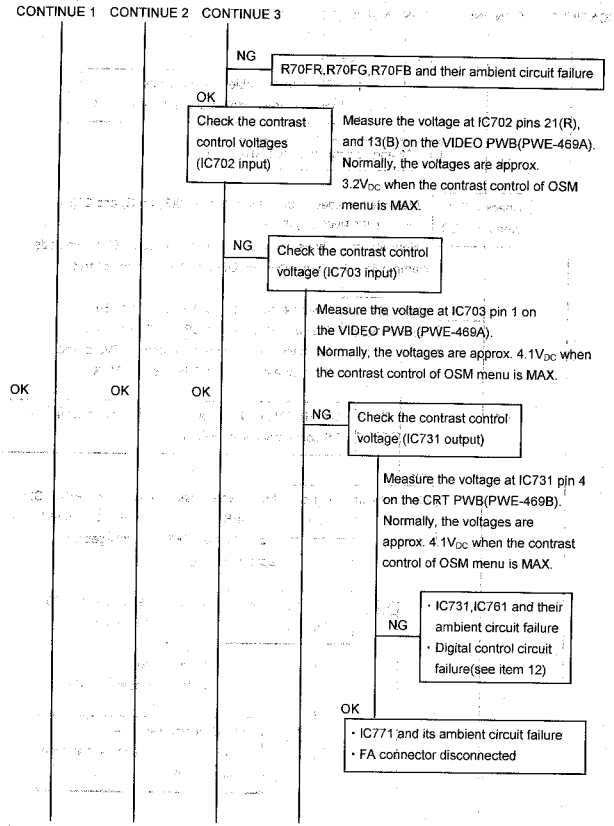
1. NO RASTER

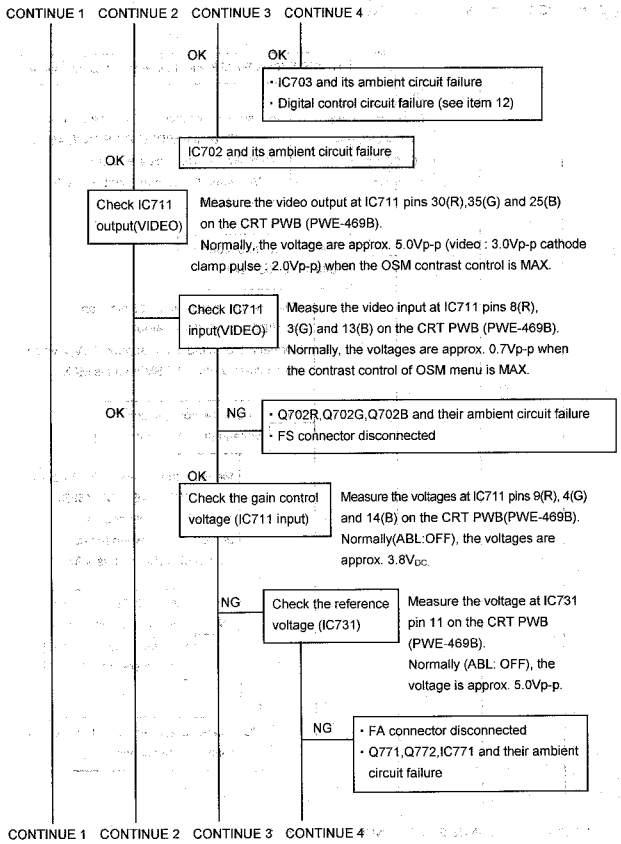

Check 200V line
Check 80V line
Check 15V line
Check -15V line
Check 9.4V line
Remove the CN-K, measure the voltages at K1(200V), K2(80V), K3(15V),K5(-15V) and PM6(9.4V) on the SW-MAIN PWB (PWE-468).
NG
Check SW REG. (see item 13)
OK
Is LED power indicator green ?
Check H and V sync input.
NG
Check PMS (see item 11)
OK
Check HV operation
Judge peculiar noise of HV generated at power SW, or static electricity.
NG
Check H OSC/DEF/HV circuit (see item 6)
OK
Check 6.3V line
Measure the voltage at TP-E on the CRT PWB (PWE-469B).
NG
IC771,Q7E1A,R7E1A,R7E1B and their ambient circuit failure
OK
Check the screen voltage
Measure the voltage at TP-G2 on the CRT PWB (PWE-469B).
Normally, screen voltage is 650±15V.
CONTINUE

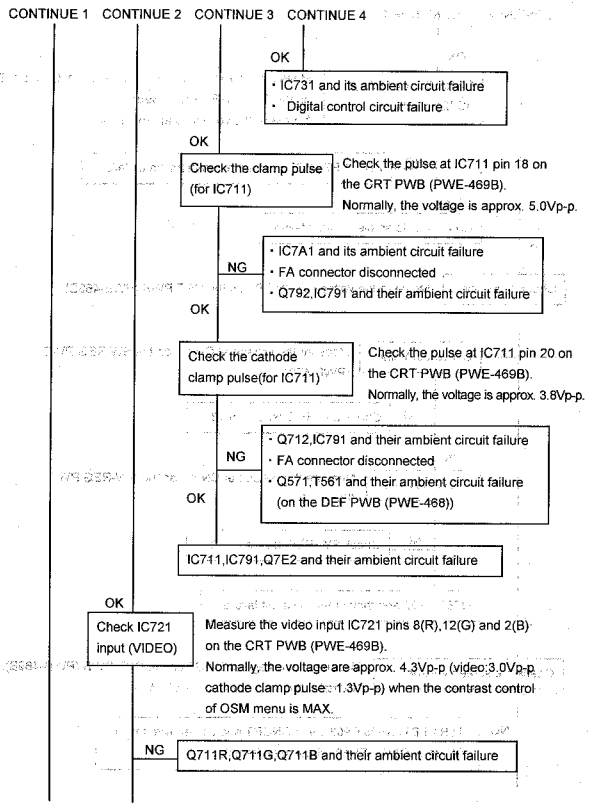

CONTINUE
NG
T5R1(FBT),R905,C903,C904,CNCRT and screen wire failure
Check H OSC/DEF/HV circuit (see item 6)
OK
Turn the screen control clockwise
Back raster appear ?
NG
Horizontal bar appear ?
NG
CRT failure
OK
Check V OSC/DEF circuit (see item 7)
OK
Video amp circuit failure (see item 2)

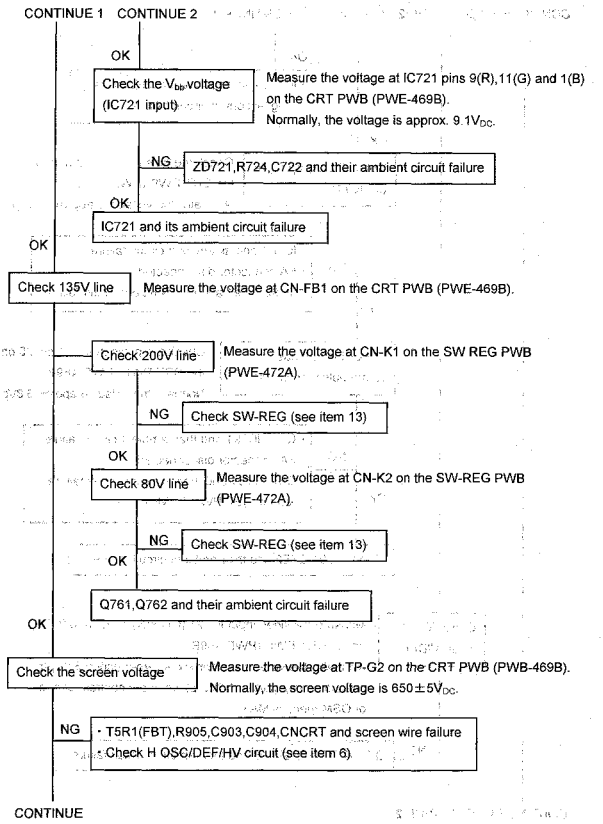
2. ABNORMAL VIDEO ON CRT SCREEN (too dark or too bright)

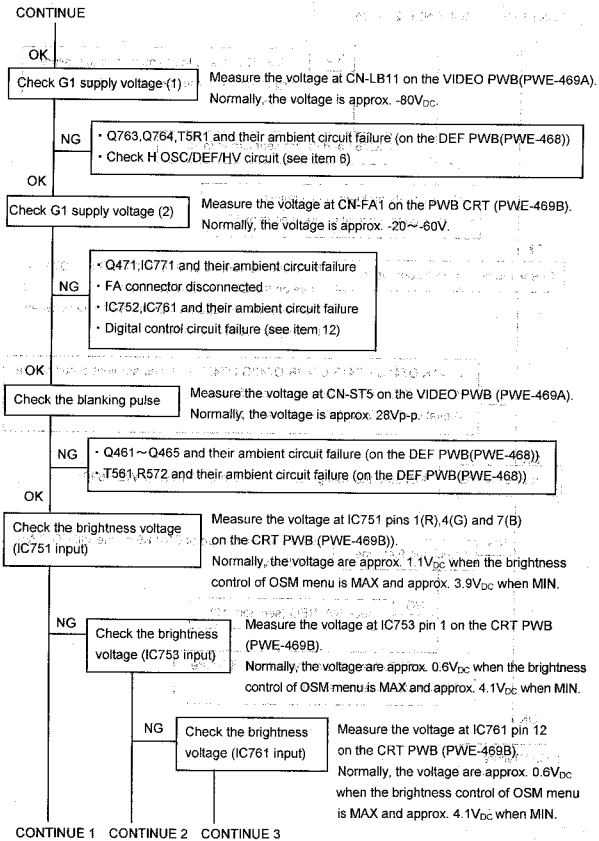

Check R/G/B video output
Measure R/G/B video outputs at TP-R,TP-G and TP-B on the CRT PWB (PWE-469B).
Normally, R/G/B video output voltages are approx. 47Vp-p with 1/4 window pattern input when the contrast control of the OSM menu is MAX.
NG
Check 80V line
Measure the voltage at CN-FB 3 on the CRT PWB(PWE-469B).
NG
Check SW REG (see item 13)
OK
Check 12V,5V and S5V line
Check the voltage at CN-LB 5(12V),6(5V) and 7(S5V) on the VIDEO PWB(PWE-469A).
NG
SW REG,IC803,IC851,Q851,Q852 and ambient circuit failure
OK
Check IC701 output(VIDEO)
Measure the video output at IC701 pins 31(R),28(G) and 25(B) on VIDEO PWB (PWE-469A).
Normally, the voltage are approx. 0.7Vp-p.
NG
Check IC701 input (VIDEO)
Measure the video input at IC701 pins 2(R D-sub), 4(G D-sub),6(B D-sub),10(R BNC) 12(G BNC) and 14(B BNC) on the VIDEO PWB(PWE-469A).
Normally, the voltage are approx. 0.7Vp-p.
NG
LC701R,LC701G,LC701B,LC702R,LC702G,LC702B and their ambient circuit failure
OK
IC701 and its ambient circuit failure
OK
Check IC702 output(VIDEO)
Measure the video output at IC702 pins 24(R),20(G) and 16(B) on the VIDEO PWB (PWE-469A).
Normally the voltage are approx. 0.7Vp-p when the contrast control of the OSM menu is MAX.
NG
Check IC702 input(VIDEO)
Measure the video input at IC702 pins 2(R), 6(G) and 10(B) on the VIDEO PWB (PWE-469A).
Normally, the voltage are approx. 0.7Vp-p.
OK
CONTINUE 1
CONTINUE 2
CONTINUE 3

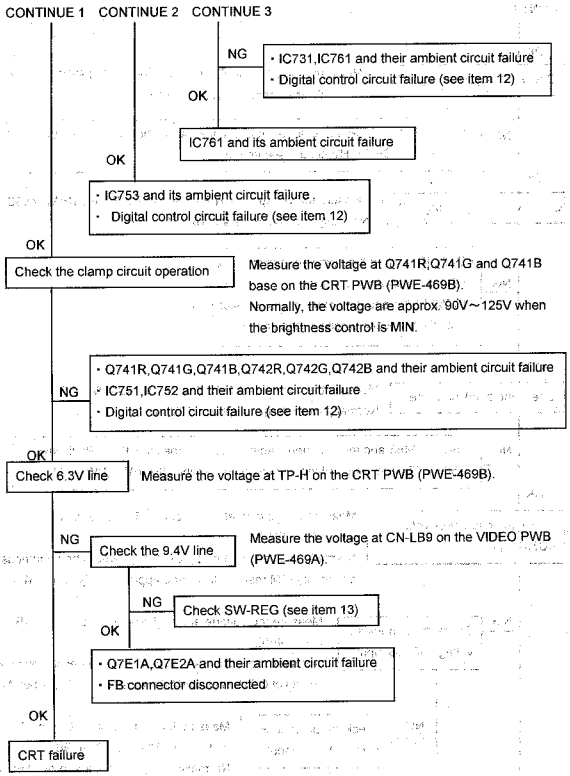

CONTINUE 1
CONTINUE 2
CONTINUE 3
NG
R70FR,R70FG,R70FB and their ambient circuit failure
OK
Check the contrast control voltages (IC702 input)
Measure the voltage at IC702 pins 21(R), and 13(B) on the VIDEO PWB(PWE-469A). Normally, the voltages are approx. 3.2VDC when the contrast control of OSM menu is MAX.
NG
Check the contrast control voltage (IC703 input)
Measure the voltage at IC703 pin 1 on the VIDEO PWB (PWE-469A). Normally, the voltages are approx. 4.1VDC when the contrast control of OSM menu is MAX.
OK
OK
OK
NG
Check the contrast control voltage (IC731 output)
Measure the voltage at IC731 pin 4 on the CRT PWB(PWE-469B). Normally, the voltages are approx. 4.1VDC when the contrast control of OSM menu is MAX.
NG
· IC731,IC761 and their ambient circuit failure
· Digital control circuit failure(see item 12)
OK
· IC771 and its ambient circuit failure
· FA connector disconnected
CONTINUE 1
CONTINUE 2
CONTINUE 3
CONTINUE 4


CONTINUE 1
CONTINUE 2
CONTINUE 3
CONTINUE 4
OK
OK
• IC703 and its ambient circuit failure
• Digital control circuit failure (see item 12)
OK
IC702 and its ambient circuit failure
Check IC711 output(VIDEO)
Measure the video output at IC711 pins 30(R),35(G) and 25(B) on the CRT PWB (PWE-469B).
Normally, the voltage are approx. 5.0Vp-p (video : 3.0Vp-p cathode clamp pulse : 2.0Vp-p) when the OSM contrast control is MAX.
Check IC711 input(VIDEO)
Measure the video input at IC711 pins 8(R), 3(G) and 13(B) on the CRT PWB (PWE-469B).
Normally, the voltages are approx. 0.7Vp-p when the contrast control of OSM menu is MAX.
OK
NG
• Q702R,Q702G,Q702B and their ambient circuit failure
• FS connector disconnected
OK
Check the gain control voltage (IC711 input)
Measure the voltages at IC711 pins 9(R), 4(G) and 14(B) on the CRT PWB(PWE-469B).
Normally(ABL:OFF), the voltages are approx. 3.8VDC.
NG
Check the reference voltage (IC731)
Measure the voltage at IC731 pin 11 on the CRT PWB (PWE-469B).
Normally (ABL: OFF), the voltage is approx. 5.0Vp-p.
NG
• FA connector disconnected
• Q771,Q772,IC771 and their ambient circuit failure
CONTINUE 1
CONTINUE 2
CONTINUE 3
CONTINUE 4


CONTINUE 1
CONTINUE 2
CONTINUE 3
CONTINUE 4
OK
• IC731 and its ambient circuit failure
• Digital control circuit failure
OK
Check the clamp pulse (for IC711)
Check the pulse at IC711 pin 18 on the CRT PWB (PWE-469B). Normally, the voltage is approx. 5.0Vp-p.
NG
• IC7A1 and its ambient circuit failure
• FA connector disconnected
• Q792,IC791 and their ambient circuit failure
OK
Check the cathode clamp pulse(for IC711)
Check the pulse at IC711 pin 20 on the CRT PWB (PWE-469B). Normally, the voltage is approx. 3.8Vp-p.
NG
• Q712,IC791 and their ambient circuit failure
• FA connector disconnected
• Q571,T561 and their ambient circuit failure (on the DEF PWB (PWE-468))
OK
IC711,IC791,Q7E2 and their ambient circuit failure
OK
Check IC721 input (VIDEO)
Measure the video input IC721 pins 8(R),12(G) and 2(B) on the CRT PWB (PWE-469B). Normally, the voltage are approx. 4.3Vp-p (video:3.0Vp-p cathode clamp pulse: 1.3Vp-p) when the contrast control of OSM menu is MAX.
NG
Q711R,Q711G,Q711B and their ambient circuit failure
CONTINUE 1
CONTINUE 2

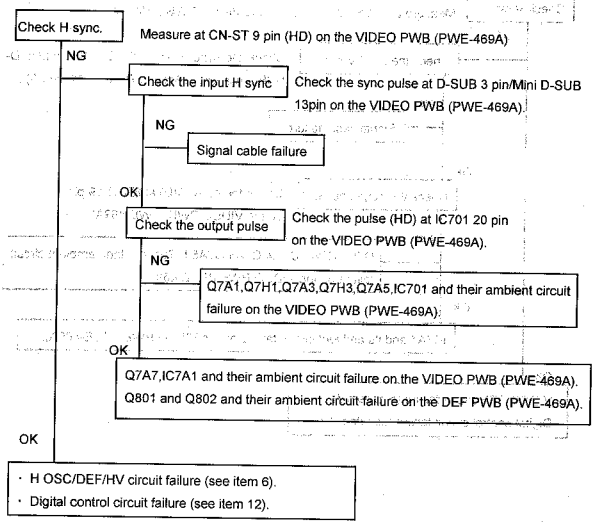

CONTINUE 1
CONTINUE 2
OK
Check the V_{bb} voltage (IC721 input)
Measure the voltage at IC721 pins 9(R),11(G) and 1(B) on the CRT PWB (PWE-469B). Normally, the voltage is approx. 9.1V_{DC}.
NG
ZD721,R724,C722 and their ambient circuit failure
OK
IC721 and its ambient circuit failure
OK
Check 135V line
Measure the voltage at CN-FB1 on the CRT PWB (PWE-469B).
Check 200V line
Measure the voltage at CN-K1 on the SW REG PWB (PWE-472A).
NG
Check SW-REG (see item 13)
OK
Check 80V line
Measure the voltage at CN-K2 on the SW-REG PWB (PWE-472A).
NG
Check SW-REG (see item 13)
OK
Q761,Q762 and their ambient circuit failure
OK
Check the screen voltage
Measure the voltage at TP-G2 on the CRT PWB (PWB-469B). Normally, the screen voltage is 650±5V_{DC}.
NG
· T5R1(FBT),R905,C903,C904,CNCRT and screen wire failure
· Check H OSC/DEF/HV circuit (see item 6)
CONTINUE


CONTINUE
OK
Check G1 supply voltage (1)
Measure the voltage at CN-LB11 on the VIDEO PWB(PWE-469A).
Normally, the voltage is approx. -80VDC.
NG
・Q763,Q764,T5R1 and their ambient circuit failure (on the DEF PWB(PWE-468))
・Check H OSC/DEF/HV circuit (see item 6)
OK
Check G1 supply voltage (2)
Measure the voltage at CN-FA1 on the PWB CRT (PWE-469B).
Normally, the voltage is approx. -20~-60V.
NG
・Q471,IC771 and their ambient circuit failure
・FA connector disconnected
・IC752,IC761 and their ambient circuit failure
・Digital control circuit failure (see item 12)
OK
Check the blanking pulse
Measure the voltage at CN-ST5 on the VIDEO PWB (PWE-469A).
Normally, the voltage is approx. 28Vp-p.
NG
・Q461~Q465 and their ambient circuit failure (on the DEF PWB(PWE-468))
・T561,R572 and their ambient circuit failure (on the DEF PWB(PWE-468))
OK
Check the brightness voltage (IC751 input)
Measure the voltage at IC751 pins 1(R),4(G) and 7(B) on the CRT PWB (PWE-469B)).
Normally, the voltage are approx. 1.1VDC when the brightness control of OSM menu is MAX and approx. 3.9VDC when MIN.
NG
Check the brightness voltage (IC753 input)
Measure the voltage at IC753 pin 1 on the CRT PWB (PWE-469B).
Normally, the voltage are approx. 0.6VDC when the brightness control of OSM menu is MAX and approx. 4.1VDC when MIN.
NG
Check the brightness voltage (IC761 input)
Measure the voltage at IC761 pin 12 on the CRT PWB (PWE-469B).
Normally, the voltage are approx. 0.6VDC when the brightness control of OSM menu is MAX and approx. 4.1VDC when MIN.
CONTINUE 1
CONTINUE 2
CONTINUE 3

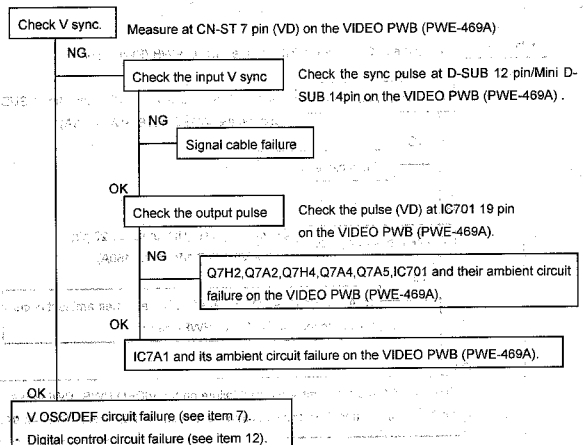

CONTINUE 1
CONTINUE 2
CONTINUE 3
NG
• IC731,IC761 and their ambient circuit failure
• Digital control circuit failure (see item 12)
OK
IC761 and its ambient circuit failure
OK
• IC753 and its ambient circuit failure
• Digital control circuit failure (see item 12)
OK
Check the clamp circuit operation
Measure the voltage at Q741R,Q741G and Q741B base on the CRT PWB (PWE-469B).
Normally, the voltage are approx. 90V~125V when the brightness control is MIN.
NG
• Q741R,Q741G,Q741B,Q742R,Q742G,Q742B and their ambient circuit failure
• IC751,IC752 and their ambient circuit failure
• Digital control circuit failure (see item 12)
OK
Check 6.3V line
Measure the voltage at TP-H on the CRT PWB (PWE-469B).
NG
Check the 9.4V line
Measure the voltage at CN-LB9 on the VIDEO PWB (PWE-469A).
NG
Check SW-REG (see item 13)
OK
• Q7E1A,Q7E2A and their ambient circuit failure
• FB connector disconnected
OK
CRT failure

3. UNSTABLE PICTURE

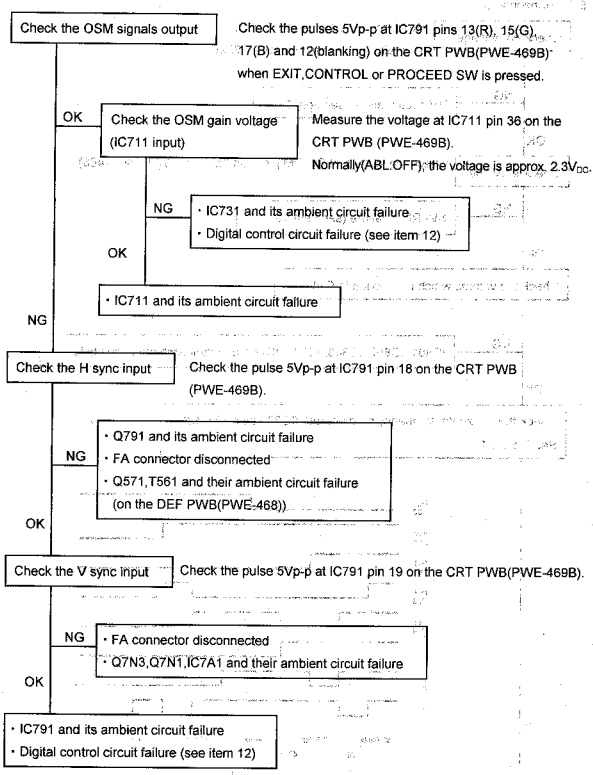
3-1 Horizontal


Check H sync.
Measure at CN-ST 9 pin (HD) on the VIDEO PWB (PWE-469A)
NG
Check the input H sync
Check the sync pulse at D-SUB 3 pin/Mini D-SUB 13pin on the VIDEO PWB (PWE-469A).
NG
Signal cable failure
OK
Check the output pulse
Check the pulse (HD) at IC701 20 pin on the VIDEO PWB (PWE-469A).
NG
Q7A1,Q7H1,Q7A3,Q7H3,Q7A5,IC701 and their ambient circuit failure on the VIDEO PWB (PWE-469A).
OK
Q7A7,IC7A1 and their ambient circuit failure on the VIDEO PWB (PWE-469A).
Q801 and Q802 and their ambient circuit failure on the DEF PWB (PWE-469A).
OK
· H OSC/DEF/HV circuit failure (see item 6).
· Digital control circuit failure (see item 12).

3-2 Vertical


Check V sync.
Measure at CN-ST 7 pin (VD) on the VIDEO PWB (PWE-469A)
NG
Check the input V sync
Check the sync pulse at D-SUB 12 pin/Mini D-SUB 14pin on the VIDEO PWB (PWE-469A) .
NG
Signal cable failure
OK
Check the output pulse
Check the pulse (VD) at IC701 19 pin on the VIDEO PWB (PWE-469A).
NG
Q7H2,Q7A2,Q7H4,Q7A4,Q7A5,IC701 and their ambient circuit failure on the VIDEO PWB (PWE-469A).
OK
IC7A1 and its ambient circuit failure on the VIDEO PWB (PWE-469A).
OK
V OSC/DEF circuit failure (see item 7).
Digital control circuit failure (see item 12).

4.ON SCREEN MANAGER (OSM) FAILURE


Check the OSM signals output
Check the pulses 5Vp-p at IC791 pins 13(R), 15(G), 17(B) and 12(blanking) on the CRT PWB(PWE-469B) when EXIT,CONTROL or PROCEED SW is pressed.
OK
Check the OSM gain voltage (IC711 input)
Measure the voltage at IC711 pin 36 on the CRT PWB (PWE-469B). Normally(ABL:OFF), the voltage is approx. 2.3VDC.
NG
· IC731 and its ambient circuit failure
· Digital control circuit failure (see item 12)
OK
· IC711 and its ambient circuit failure
NG
Check the H sync input
Check the pulse 5Vp-p at IC791 pin 18 on the CRT PWB (PWE-469B).
NG
· Q791 and its ambient circuit failure
· FA connector disconnected
· Q571,T561 and their ambient circuit failure (on the DEF PWB(PWE-468))
OK
Check the V sync input
Check the pulse 5Vp-p at IC791 pin 19 on the CRT PWB(PWE-469B).
NG
· FA connector disconnected
· Q7N3,Q7N1,IC7A1 and their ambient circuit failure
OK
· IC791 and its ambient circuit failure
· Digital control circuit failure (see item 12)

5. ABNORMAL PICTURE

5-1 Horizontal Size

Check HV voltage

Measure the voltage at CRT anode.
Normally, the voltage is approx. 25kV.

NG → HV circuit failure (see item 6)

OK

Check 9.4V line

Check the voltage at CN-PM pin 6 on the DEF PWB (PWE-468).

NG → SW REG. failure (see item 13)

OK

Check the voltage which is supplied to CPU

NG → IC801, IC802, IC803, IC701, IC7A1 and their ambient circuit failure

OK

Check the horizontal frequency mode output (IC801 pins 35~42)
See Fig 5.1.1

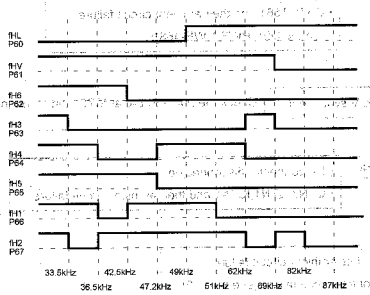


Fig 5.1.1

CONTINUE

CONTINUE

NG → CPU (IC801) failure

OK

Check S-correction capacitor switching circuit

Check the operation of MQ581

NG → MQ581 failure

OK

Check whether IC5H1 pin 5 on DEF PWB and IC531 pin 7 vary by horizontal size control in OSM menu or not

Measure the voltage at IC5H1 pin 5 and IC531 pin 7.
Normally, pin 5 voltage varies from approx. 4V to 3V and pin 7 voltage varies from approx. 0.9V to 5V.

NG → Digital control circuit or IC5C1 failure

OK

Check Q554 FBP
See Fig. 5.1.2

Measure the voltage at Q554 Collector.
Normally, this voltage varies from 850 to 1100V by H-SIZE control for user.

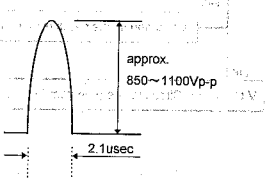


Fig. 5.1.2

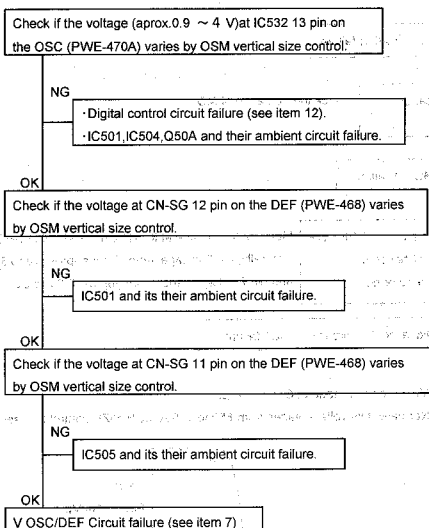
NG → Q554,D553,D555,C553,H-DY and their ambient circuit failure

OK

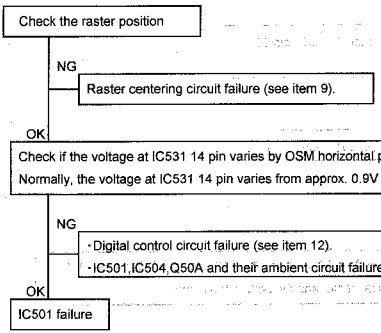
Check the distortion correction circuit (see item 5-6)

H OSC/DEF/HV circuit failure (see item 6)

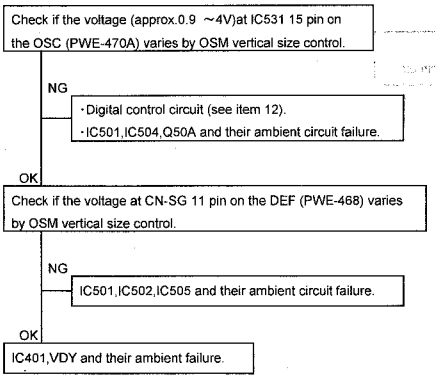
5-2 Vertical Size


Check if the voltage (aprox.0.9 ~ 4 V)at IC532 13 pin on the OSC (PWE-470A) varies by OSM vertical size control.
NG
·Digital control circuit failure (see item 12).
·IC501,IC504,Q50A and their ambient circuit failure.
OK
Check if the voltage at CN-SG 12 pin on the DEF (PWE-468) varies by OSM vertical size control.
NG
IC501 and its their ambient circuit failure.
OK
Check if the voltage at CN-SG 11 pin on the DEF (PWE-468) varies by OSM vertical size control.
NG
IC505 and its their ambient circuit failure.
OK
V OSC/DEF Circuit failure (see item 7)

5-3 Horizontal Position


Check the raster position
NG
Raster centering circuit failure (see item 9).
OK
Check if the voltage at IC531 14 pin varies by OSM horizontal position control.
Normally, the voltage at IC531 14 pin varies from approx. 0.9V to approx.4V.
NG
・Digital control circuit failure (see item 12).
・IC501,IC504,Q50A and their ambient circuit failure.
OK
IC501 failure

5-4 Vertical Position


Check if the voltage (approx.0.9 ～4V)at IC531 15 pin on
the OSC (PWE-470A) varies by OSM vertical size control.
NG
・Digital control circuit (see item 12).
・IC501,IC504,Q50A and their ambient circuit failure.
OK
Check if the voltage at CN-SG 11 pin on the DEF (PWE-468) varies
by OSM vertical size control.
NG
IC501,IC502,IC505 and their ambient circuit failure.
OK
IC401,VDY and their ambient failure.

5-5 Poor Linearity

5-5-1 Horizontal

Check the digital control circuit output (IC801 pin 35-42)
See item 5-1

OK

L581,MQ581,and their ambient circuit failure

5-5-2 Vertical

Check if the voltage (approx.0.9～4V)at IC532 pins 14 (VLS) and 15 (VLC) on the OSC (PWE-470A) varies by OSM vertical center and the bottom/top control.

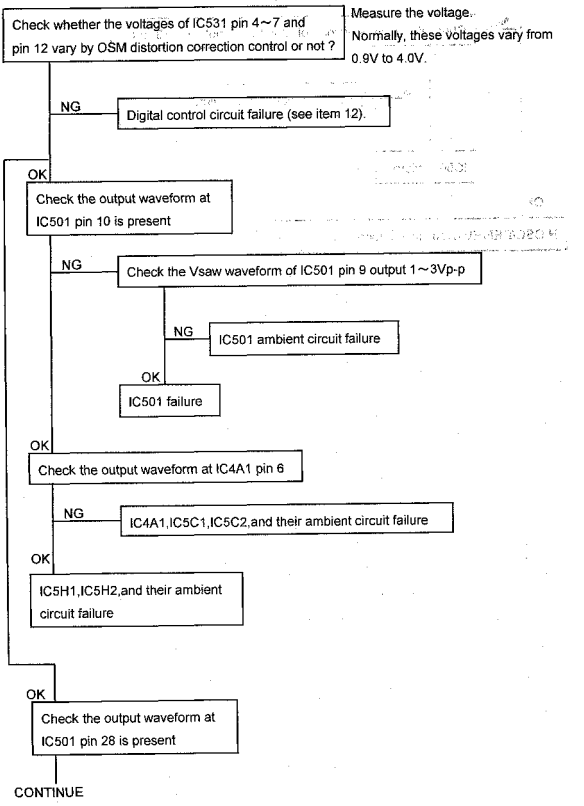
NG

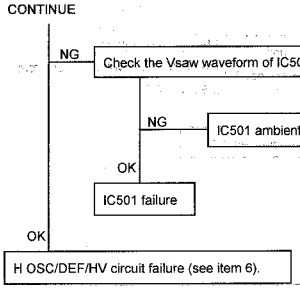
- Digital control circuit failure(see item 12).
- IC501,IC504,Q50A and their ambient circuit failure.

OK

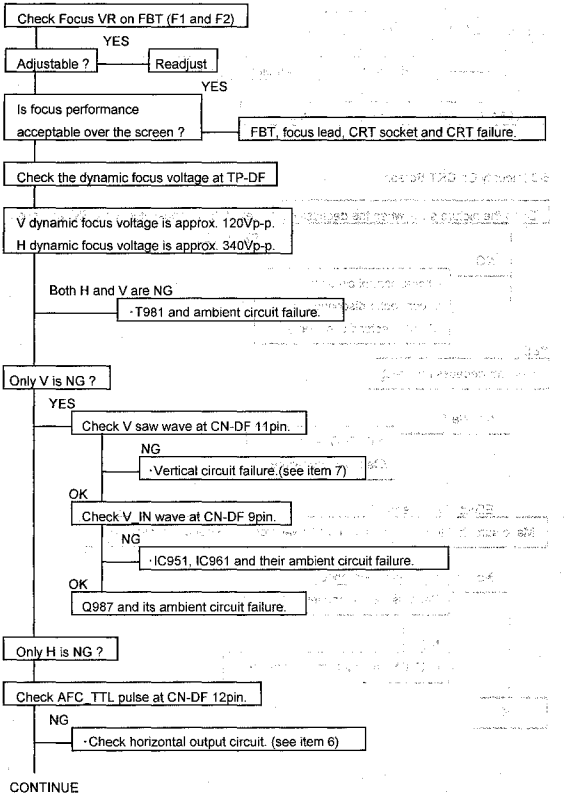
- IC501 failure.
- Distortion correction circuit

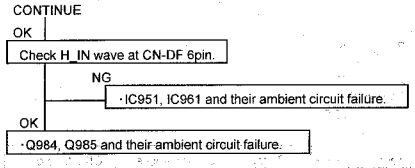
5-6 Distortion Correction Circuit


Check whether the voltages of IC531 pin 4~7 and pin 12 vary by OSM distortion correction control or not ?
Measure the voltage.
Normally, these voltages vary from 0.9V to 4.0V.
NG
Digital control circuit failure (see item 12).
OK
Check the output waveform at IC501 pin 10 is present
NG
Check the Vsaw waveform of IC501 pin 9 output 1~3Vp-p
NG
IC501 ambient circuit failure
OK
IC501 failure
OK
Check the output waveform at IC4A1 pin 6
NG
IC4A1,IC5C1,IC5C2,and their ambient circuit failure
OK
IC5H1,IC5H2,and their ambient circuit failure
OK
Check the output waveform at IC501 pin 28 is present
CONTINUE

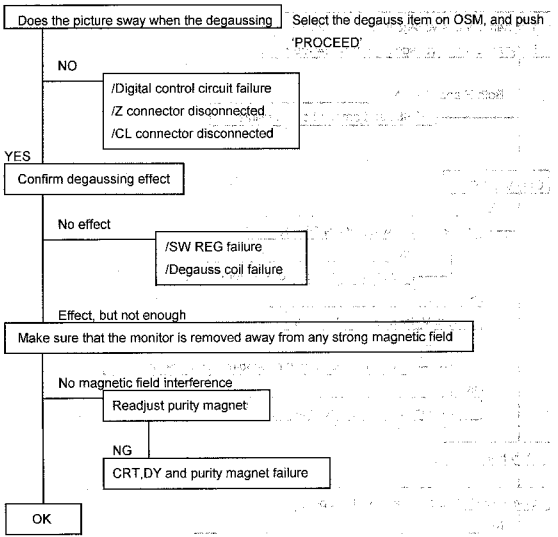

CONTINUE
NG
Check the Vsaw waveform of IC501 pin 9 output 1～3Vp-p
NG
IC501 ambient circuit failure
OK
IC501 failure
OK
H OSC/DEF/HV circuit failure (see item 6).

5-7 Poor Focus

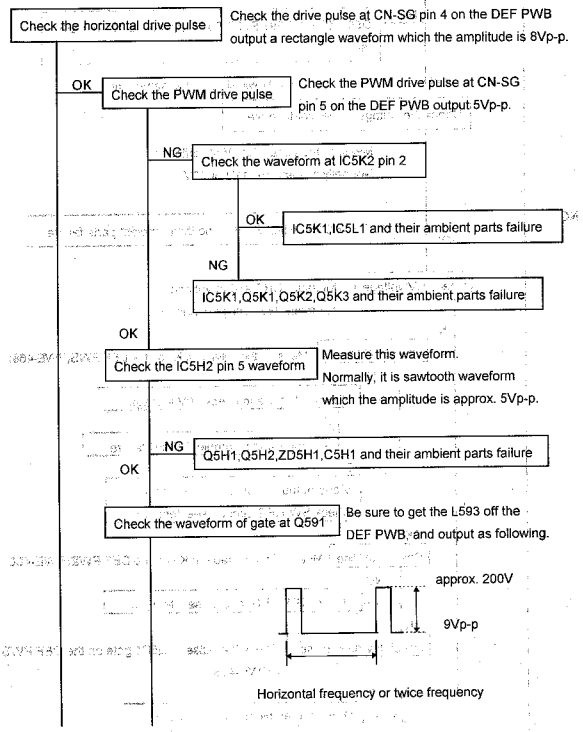

Check Focus VR on FBT (F1 and F2)
YES
Adjustable ?
Readjust
YES
Is focus performance acceptable over the screen ?
FBT, focus lead, CRT socket and CRT failure.
Check the dynamic focus voltage at TP-DF
V dynamic focus voltage is approx. 120Vp-p.
H dynamic focus voltage is approx. 340Vp-p.
Both H and V are NG
·T981 and ambient circuit failure.
Only V is NG ?
YES
Check V saw wave at CN-DF 11pin.
NG
·Vertical circuit failure.(see item 7)
OK
Check V_IN wave at CN-DF 9pin.
NG
·IC951, IC961 and their ambient circuit failure.
OK
Q987 and its ambient circuit failure.
Only H is NG ?
Check AFC_TTL pulse at CN-DF 12pin.
NG
·Check horizontal output circuit. (see item 6)
CONTINUE

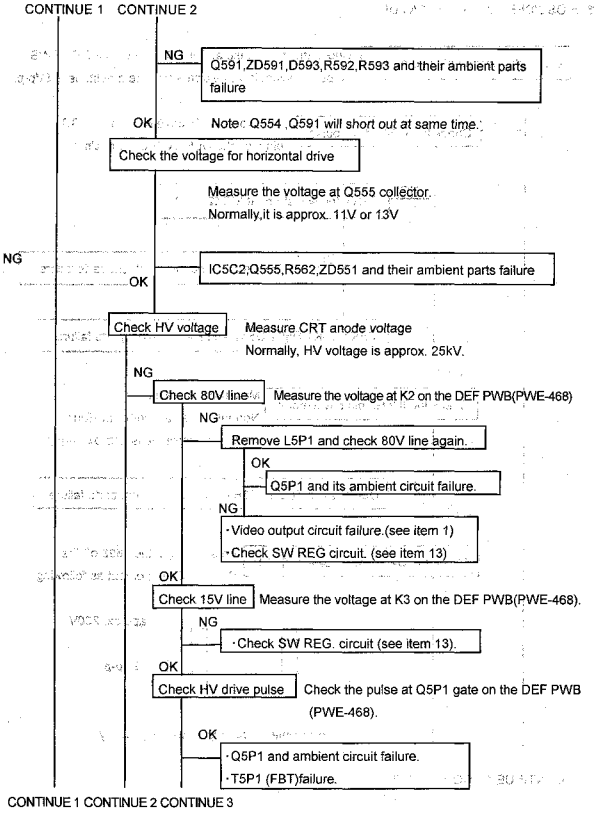


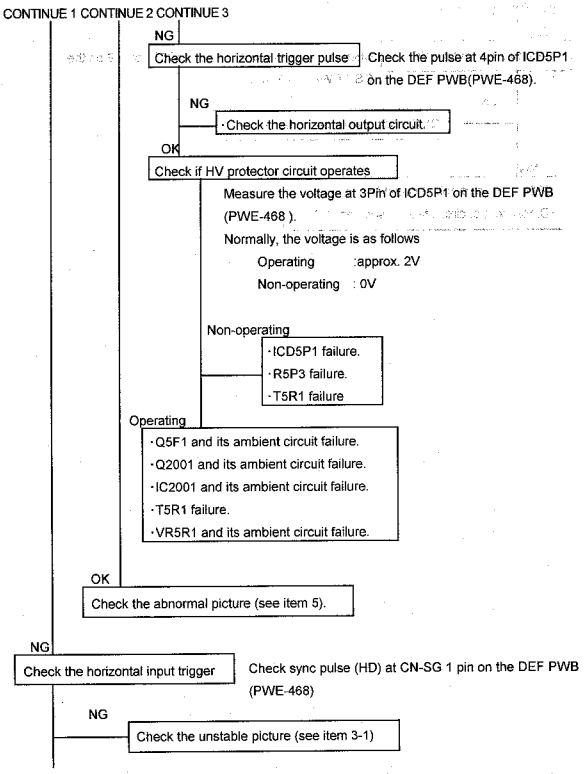
5-8 Impurity On CRT Screen



6. H OSC/DEF/HV CIRCUIT FAILURE


Check the horizontal drive pulse
Check the drive pulse at CN-SG pin 4 on the DEF PWB output a rectangle waveform which the amplitude is 8Vp-p.
OK
Check the PWM drive pulse
Check the PWM drive pulse at CN-SG pin 5 on the DEF PWB output 5Vp-p.
NG
Check the waveform at IC5K2 pin 2
OK
IC5K1,IC5L1 and their ambient parts failure
NG
IC5K1,Q5K1,Q5K2,Q5K3 and their ambient parts failure
OK
Check the IC5H2 pin 5 waveform
Measure this waveform. Normally, it is sawtooth waveform which the amplitude is approx. 5Vp-p.
NG
Q5H1,Q5H2,ZD5H1,C5H1 and their ambient parts failure
OK
Check the waveform of gate at Q591
Be sure to get the L593 off the DEF PWB, and output as following.
approx. 200V
9Vp-p
Horizontal frequency or twice frequency
CONTINUE 1
CONTINUE 2


CONTINUE 1
CONTINUE 2
NG
Q591,ZD591,D593,R592,R593 and their ambient parts failure
OK
Note: Q554 ,Q591 will short out at same time.
Check the voltage for horizontal drive
Measure the voltage at Q555 collector.
Normally,it is approx. 11V or 13V
NG
IC5C2,Q555,R562,ZD551 and their ambient parts failure
OK
Check HV voltage
Measure CRT anode voltage
Normally, HV voltage is approx. 25kV.
NG
Check 80V line
Measure the voltage at K2 on the DEF PWB(PWE-468)
NG
Remove L5P1 and check 80V line again.
OK
Q5P1 and its ambient circuit failure.
NG
·Video output circuit failure.(see item 1)
·Check SW REG circuit. (see item 13)
OK
Check 15V line
Measure the voltage at K3 on the DEF PWB(PWE-468).
NG
·Check SW REG. circuit (see item 13).
OK
Check HV drive pulse
Check the pulse at Q5P1 gate on the DEF PWB (PWE-468).
OK
·Q5P1 and ambient circuit failure.
·T5P1 (FBT)failure.
CONTINUE 1 CONTINUE 2 CONTINUE 3


CONTINUE 1 CONTINUE 2 CONTINUE 3
NG
Check the horizontal trigger pulse
Check the pulse at 4pin of ICD5P1 on the DEF PWB(PWE-468).
NG
·Check the horizontal output circuit.
OK
Check if HV protector circuit operates
Measure the voltage at 3Pin of ICD5P1 on the DEF PWB (PWE-468).
Normally, the voltage is as follows
Operating :approx. 2V
Non-operating : 0V
Non-operating
·ICD5P1 failure.
·R5P3 failure.
·T5R1 failure
Operating
·Q5F1 and its ambient circuit failure.
·Q2001 and its ambient circuit failure.
·IC2001 and its ambient circuit failure.
·T5R1 failure.
·VR5R1 and its ambient circuit failure.
OK
Check the abnormal picture (see item 5).
NG
Check the horizontal input trigger
Check sync pulse (HD) at CN-SG 1 pin on the DEF PWB (PWE-468)
NG
Check the unstable picture (see item 3-1)
CONTINUE

CONTINUE

OK

Check the horizontal OSC. → Check the pulse approx.8Vp-p at IC501 pin 18 on the OSC PWB (PWE-470A)

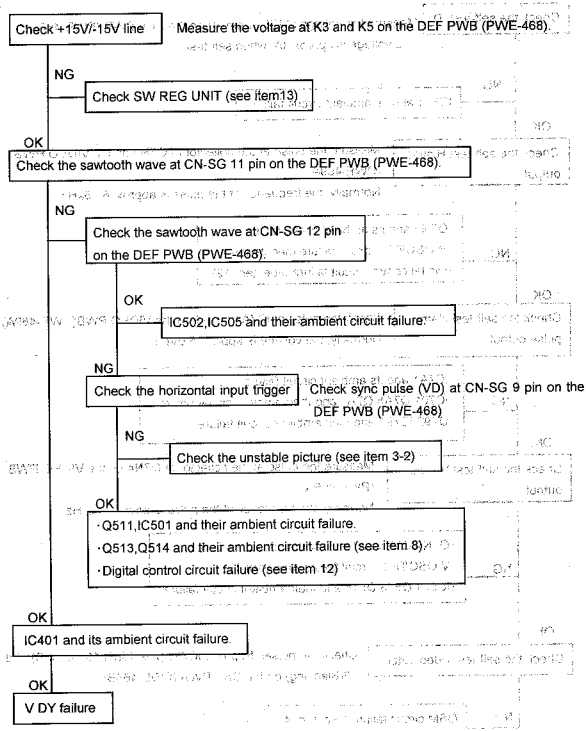
OK

→ Q510 and its ambient circuit failure.

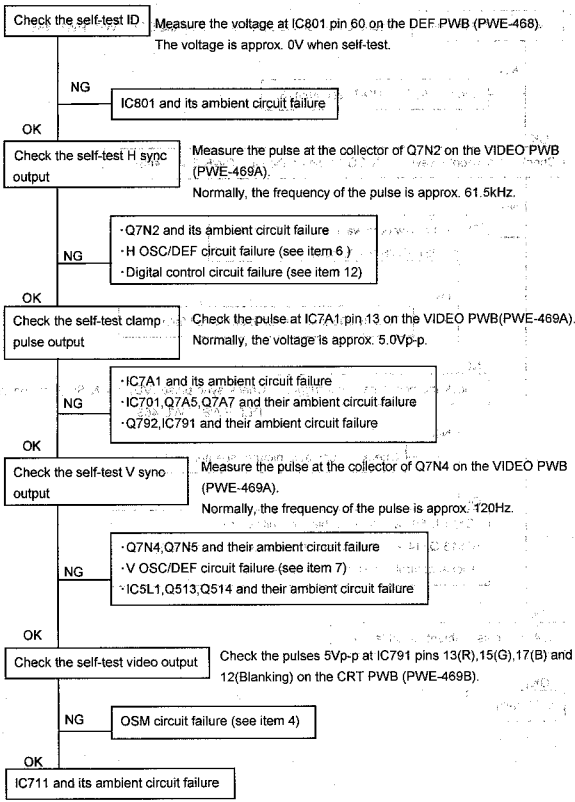
NG

- IC501 and its ambient circuit failure.
- Digital control circuit failure (see item 12)

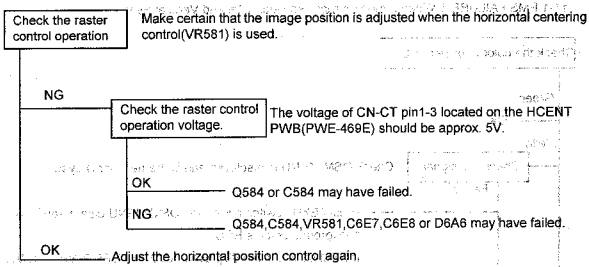
7. V OSC/DEF CIRCUIT FAILURE


Check +15V/-15V line
Measure the voltage at K3 and K5 on the DEF PWB (PWE-468).
NG
Check SW REG UNIT (see item13)
OK
Check the sawtooth wave at CN-SG 11 pin on the DEF PWB (PWE-468).
NG
Check the sawtooth wave at CN-SG 12 pin on the DEF PWB (PWE-468).
OK
IC502,IC505 and their ambient circuit failure.
NG
Check the horizontal input trigger
Check sync pulse (VD) at CN-SG 9 pin on the DEF PWB (PWE-468)
NG
Check the unstable picture (see item 3-2)
OK
·Q511,IC501 and their ambient circuit failure.
·Q513,Q514 and their ambient circuit failure (see item 8).
·Digital control circuit failure (see item 12)
OK
IC401 and its ambient circuit failure.
OK
V DY failure

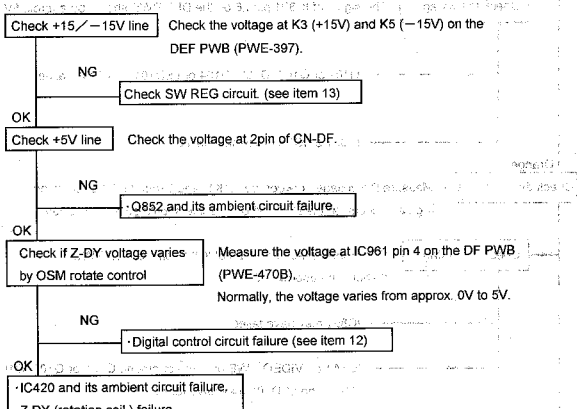
8. SELF TEST ERROR


Check the self-test ID
Measure the voltage at IC801 pin 60 on the DEF PWB (PWE-468).
The voltage is approx. 0V when self-test.
NG
IC801 and its ambient circuit failure
OK
Check the self-test H sync output
Measure the pulse at the collector of Q7N2 on the VIDEO PWB (PWE-469A).
Normally, the frequency of the pulse is approx. 61.5kHz.
NG
·Q7N2 and its ambient circuit failure
·H OSC/DEF circuit failure (see item 6)
·Digital control circuit failure (see item 12)
OK
Check the self-test clamp pulse output
Check the pulse at IC7A1 pin 13 on the VIDEO PWB(PWE-469A).
Normally, the voltage is approx. 5.0Vp-p.
NG
·IC7A1 and its ambient circuit failure
·IC701,Q7A5,Q7A7 and their ambient circuit failure
·Q792,IC791 and their ambient circuit failure
OK
Check the self-test V sync output
Measure the pulse at the collector of Q7N4 on the VIDEO PWB (PWE-469A).
Normally, the frequency of the pulse is approx. 120Hz.
NG
·Q7N4,Q7N5 and their ambient circuit failure
·V OSC/DEF circuit failure (see item 7)
·IC5L1,Q513,Q514 and their ambient circuit failure
OK
Check the self-test video output
Check the pulses 5Vp-p at IC791 pins 13(R),15(G),17(B) and 12(Blanking) on the CRT PWB (PWE-469B).
NG
OSM circuit failure (see item 4)
OK
IC711 and its ambient circuit failure

9. RASTER CENTERING CIRCUIT FAILURE

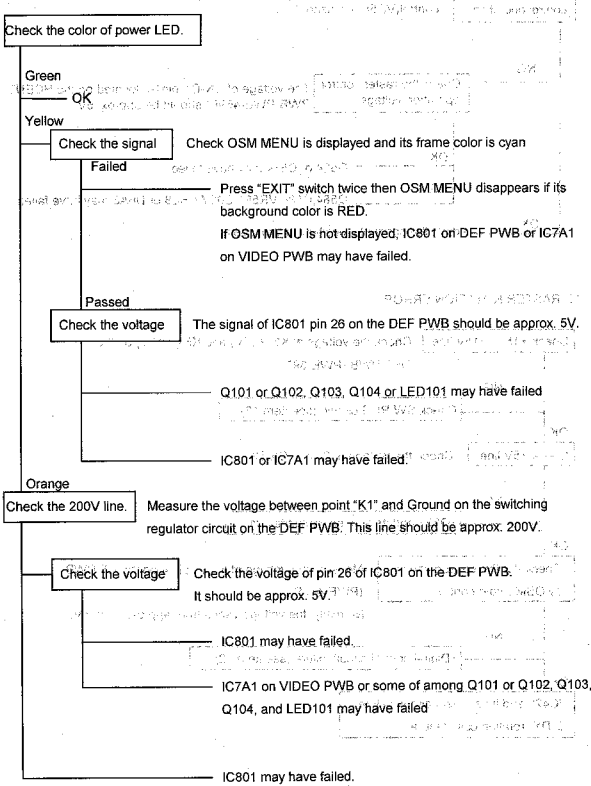

Check the raster control operation
Make certain that the image position is adjusted when the horizontal centering control(VR581) is used.
NG
Check the raster control operation voltage.
The voltage of CN-CT pin1-3 located on the HCENT PWB(PWE-469E) should be approx. 5V.
OK
Q584 or C584 may have failed.
NG
Q584,C584,VR581,C6E7,C6E8 or D6A6 may have failed.
OK
Adjust the horizontal position control again.

10. RASTER ROTATION ERROR


Check +15／−15V line
Check the voltage at K3 (+15V) and K5 (−15V) on the DEF PWB (PWE-397).
NG
Check SW REG circuit. (see item 13)
OK
Check +5V line
Check the voltage at 2pin of CN-DF.
NG
·Q852 and its ambient circuit failure.
OK
Check if Z-DY voltage varies by OSM rotate control
Measure the voltage at IC961 pin 4 on the DF PWB (PWE-470B).
Normally, the voltage varies from approx. 0V to 5V.
NG
·Digital control circuit failure (see item 12)
OK
·IC420 and its ambient circuit failure.
·Z DY (rotation coil) failure

11. POWER MANAGEMENT SYSTEM (PMS) FAILURE

11-1 PMS FAILURE 1(When a monitor receives Horizontal and Vertical Sync.)


Check the color of power LED.
Green
OK
Yellow
Check the signal
Check OSM MENU is displayed and its frame color is cyan
Failed
Press "EXIT" switch twice then OSM MENU disappears if its background color is RED.
If OSM MENU is not displayed, IC801 on DEF PWB or IC7A1 on VIDEO PWB may have failed.
Passed
Check the voltage
The signal of IC801 pin 26 on the DEF PWB should be approx. 5V.
Q101 or Q102, Q103, Q104 or LED101 may have failed
IC801 or IC7A1 may have failed.
Orange
Check the 200V line.
Measure the voltage between point "K1" and Ground on the switching regulator circuit on the DEF PWB. This line should be approx. 200V.
Check the voltage
Check the voltage of pin 26 of IC801 on the DEF PWB.
It should be approx. 5V.
IC801 may have failed.
IC7A1 on VIDEO PWB or some of among Q101 or Q102, Q103, Q104, and LED101 may have failed
IC801 may have failed.

11-2 PMS FAILURE 2(When a monitor receives no Horizontal Sync)

Check the PMS control voltage.

Check the voltage of pin 26 of IC801.
The voltage should be approx. 5V.

Failed → IC801 or IC7A1 may have failed.

Passed → IC801 may have failed.

11-3 PMS FAILURE 3(When a monitor receives no Vertical Sync)

Check the PMS control voltage.

Check the voltage of pin 33 of IC801.
The voltage should be approx. 0V.

Failed → IC801 or IC7A1 may have failed

Passed → IC801 may have failed. In case power consumption is too high, then some of Q851, Q852, Q855, Q856, Q857, Q858(DEF PWB) ,and Q858(SW. REG PWB) may have failed

11-4 PMS FAILURE 4(When monitor receives neither Horizontal nor Vertical Sync)

Check the PMS control voltage.

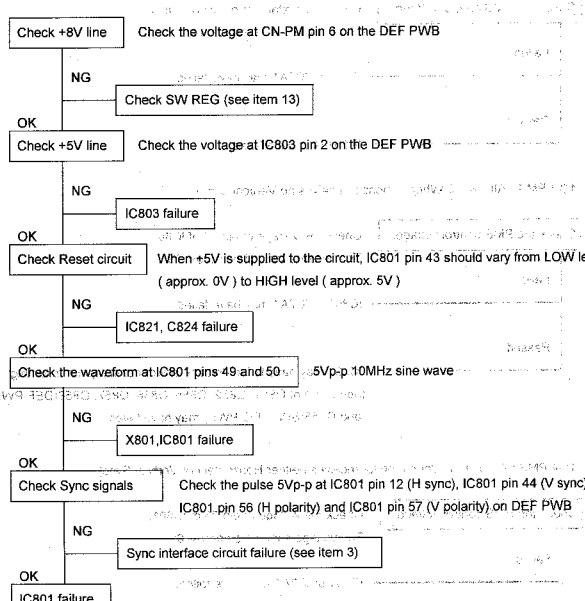
Check the voltage of pin 26 of IC801.
The voltage should be approx. 0V.

Failed → IC801 or IC7A1 may have failed.

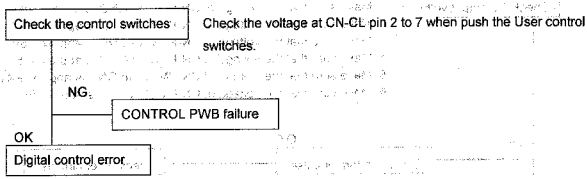
Passed → PC601 may have failed.

12. DIGITAL CONTROL CIRCUIT FAILURE

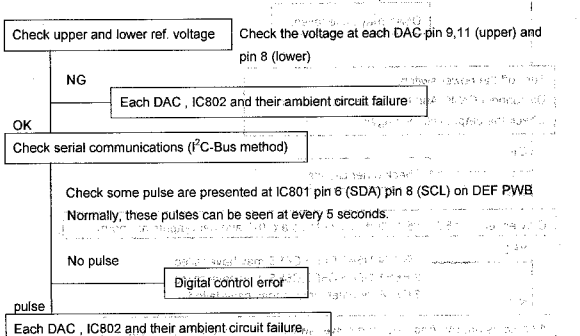
12-1. Digital control error


Check +8V line
Check the voltage at CN-PM pin 6 on the DEF PWB
NG
Check SW REG (see item 13)
OK
Check +5V line
Check the voltage at IC803 pin 2 on the DEF PWB
NG
IC803 failure
OK
Check Reset circuit
When +5V is supplied to the circuit, IC801 pin 43 should vary from LOW level (approx. 0V) to HIGH level (approx. 5V)
NG
IC821, C824 failure
OK
Check the waveform at IC801 pins 49 and 50
5Vp-p 10MHz sine wave
NG
X801,IC801 failure
OK
Check Sync signals
Check the pulse 5Vp-p at IC801 pin 12 (H sync), IC801 pin 44 (V sync), IC801 pin 56 (H polarity) and IC801 pin 57 (V polarity) on DEF PWB
NG
Sync interface circuit failure (see item 3)
OK
IC801 failure

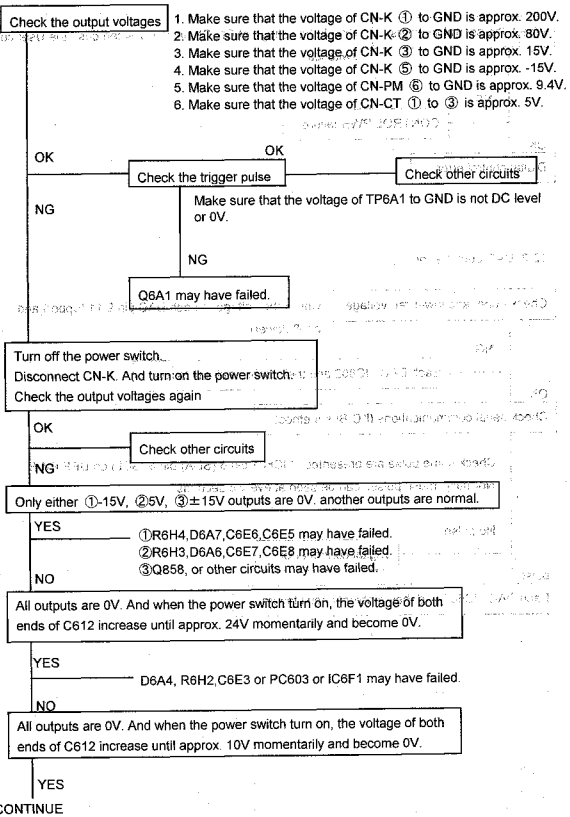
12-2. User control error

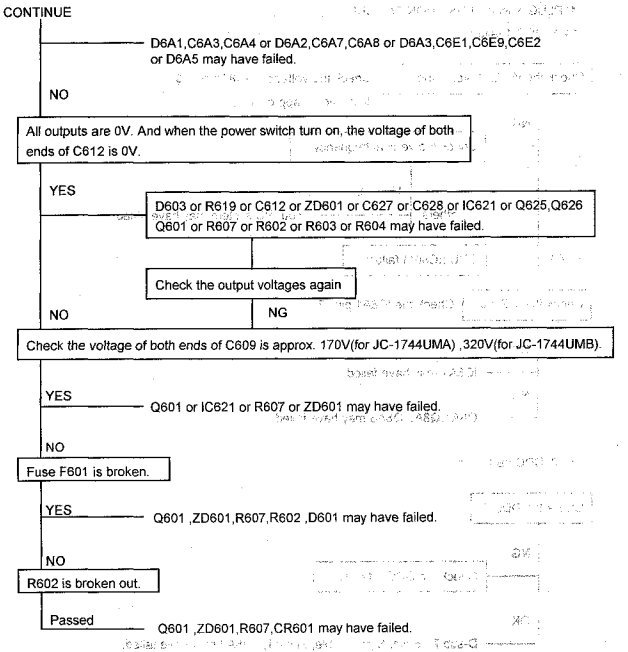

Check the control switches
Check the voltage at CN-CL pin 2 to 7 when push the User control switches.
NG
CONTROL PWB failure
OK
Digital control error

12-3. DAC output error


Check upper and lower ref. voltage
Check the voltage at each DAC pin 9,11 (upper) and pin 8 (lower)
NG
Each DAC , IC802 and their ambient circuit failure
OK
Check serial communications (I2C-Bus method)
Check some pulse are presented at IC801 pin 6 (SDA) pin 8 (SCL) on DEF PWB
Normally, these pulses can be seen at every 5 seconds.
No pulse
Digital control error
pulse
Each DAC , IC802 and their ambient circuit failure

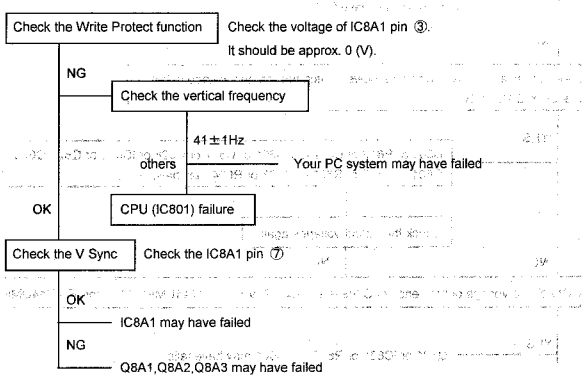
13. SWITCHING REGULATOR CIRCUIT FAILURE


Check the output voltages
1. Make sure that the voltage of CN-K ① to GND is approx. 200V.
2. Make sure that the voltage of CN-K ② to GND is approx. 80V.
3. Make sure that the voltage of CN-K ③ to GND is approx. 15V.
4. Make sure that the voltage of CN-K ⑤ to GND is approx. -15V.
5. Make sure that the voltage of CN-PM ⑥ to GND is approx. 9.4V.
6. Make sure that the voltage of CN-CT ① to ③ is approx. 5V.
OK
OK
Check the trigger pulse
Check other circuits
NG
Make sure that the voltage of TP6A1 to GND is not DC level or 0V.
NG
Q6A1 may have failed.
Turn off the power switch.
Disconnect CN-K. And turn on the power switch.
Check the output voltages again
OK
Check other circuits
NG
Only either ①-15V, ②5V, ③±15V outputs are 0V. another outputs are normal.
YES
①R6H4,D6A7,C6E6,C6E5 may have failed.
②R6H3,D6A6,C6E7,C6E8 may have failed.
③Q858, or other circuits may have failed.
NO
All outputs are 0V. And when the power switch turn on, the voltage of both ends of C612 increase until approx. 24V momentarily and become 0V.
YES
D6A4, R6H2,C6E3 or PC603 or IC6F1 may have failed.
NO
All outputs are 0V. And when the power switch turn on, the voltage of both ends of C612 increase until approx. 10V momentarily and become 0V.
YES
CONTINUE

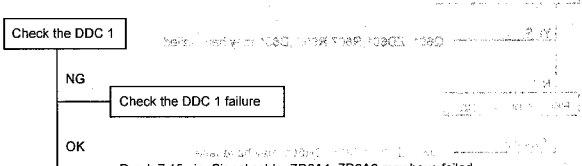

CONTINUE
D6A1,C6A3,C6A4 or D6A2,C6A7,C6A8 or D6A3,C6E1,C6E9,C6E2 or D6A5 may have failed.
NO
All outputs are 0V. And when the power switch turn on, the voltage of both ends of C612 is 0V.
YES
D603 or R619 or C612 or ZD601 or C627 or C628 or IC621 or Q625,Q626 Q601 or R607 or R602 or R603 or R604 may have failed.
Check the output voltages again
NO
NG
Check the voltage of both ends of C609 is approx. 170V(for JC-1744UMA) ,320V(for JC-1744UMB).
YES
Q601 or IC621 or R607 or ZD601 may have failed.
NO
Fuse F601 is broken.
YES
Q601 ,ZD601,R607,R602 ,D601 may have failed.
NO
R602 is broken out.
Passed
Q601 ,ZD601,R607,CR601 may have failed.

14. PLUG & PLAY FUNCTION FAILURE

14-1. DDC 1 failure



14-2. DDC 2B failure



CIRCUIT DESCRIPTION

TABLE OF CONTENTS

Page

1. VIDEO CIRCUIT 107
1) Video Signal Amplification Section 107
2) Brightness and Cut-off Control Section 108
3) ABL Circuit 109
4) On Screen Manager (OSM) 109
5) Self Test 110

2. DEFLECTION CIRCUIT 111
2-1. HORIZONTAL DEFLECTION CIRCUIT 111
1) Horizontal Oscillation Circuit 111
2) Horizontal Drive Circuit 115
3) Horizontal Deflection Output Circuit 115
4) Horizontal Size Control Circuit 115
5) Distortion Correction Circuit 118
6) Rotation Correction Circuit 119
7) H Centering Circuit 119

2-2. VERTICAL DEFLECTION CIRCUIT 120
1) Sawtooth Wave Form Generating and Wave Form Corrective Section 120
2) Vertical Raster Position Control Section 120
3) Vertical Output Amplifier Section 121

3. HIGH VOLTAGE CIRCUIT 122
1) High Voltage Control Circuit 122
2) High Voltage Output Circuit 122
3) High Voltage Protector Circuit 122

4. VIDEO BLANKING CIRCUIT 124
1) Blanking Circuit 124
2) Sub Bias Circuit 124
3) Spot Killer Circuit 124

5. DYNAMIC FOCUS CIRCUIT 126
1) Horizontal Parabolic Wave Generation and Gain Control Circuit 126
2) Vertical Parabolic Wave Generation and Gain Control Circuit 126
3) Output Amplifier Circuit and Coupling Circuit 126
6. CPU CIRCUIT 128
1) CPU 128
2) DC Control circuit 130
3) Power Management System (PMS) Circuit 132
4) Plug and Play (DDC1/2) 134
5) User Control Operation 135
6) Open SUB MENU 139
7) Turn off OSM MENU 140
8) Open MENU(s) 140
OSM MENU STRUCTURE 142
7. MOIRE CHANCELLOR 148
8. SWITCHING REGULATOR CIRCUIT 149
1) Rectifying and Smoothing Circuit 149
2) Auxiliary Power Supply Circuit 149
3) Converter Circuit 150
4) Output Rectifying and Smoothing Circuit 151
5) Error Detection Amplifier Circuit 152
6) Synchronized Circuit 152
7) Oscillating and Control Circuit 153
8) Overvoltage Protection 154
9) Degaussing Circuit 155
10) Posistor's Automatic Selective Circuit 155

1. VIDEO CIRCUIT

1) Video Signal Amplification Section

The video signal amplification section basically consists of the input section circuit and the amplification circuit.

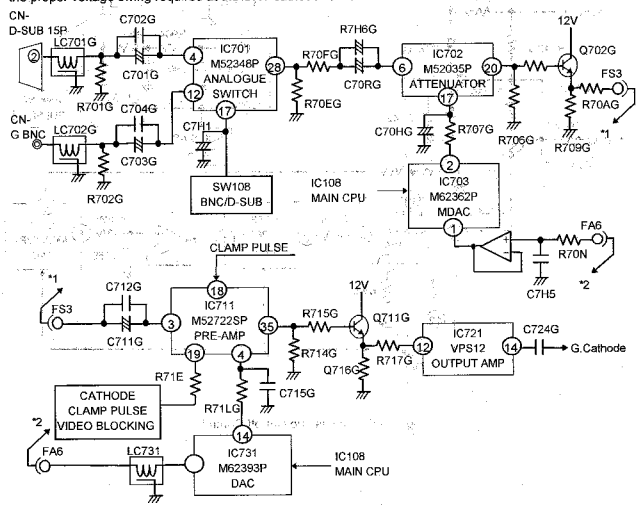
Each Red(R),Green(G) and Blue(B) video signal circuit is identical to each other, the G circuit wil be described here.

The input selection circuit selects the BNC input or D-SUB input according to the voltage of IC701 pin 17, open or 0V.

The amplification circuit is constructed with IC702(Attenuator), buffer Q702G,IC711(Pre-amp), buffer Q711G, IC721(Output amp),AccuColor controller IC703(MDAC) and gain controller IC731(DAC).

The selected input signal is fed to IC702 and attenuated according to the user CONTRAST control. This attenuated video signal and the gain control signal from IC731(DAC) are applied to IC711.

The output of IC711 being buffered by Q711G and fed to IC721(Output amp), the signal is amplified to the proper voltage swing required at the CRT cathode.



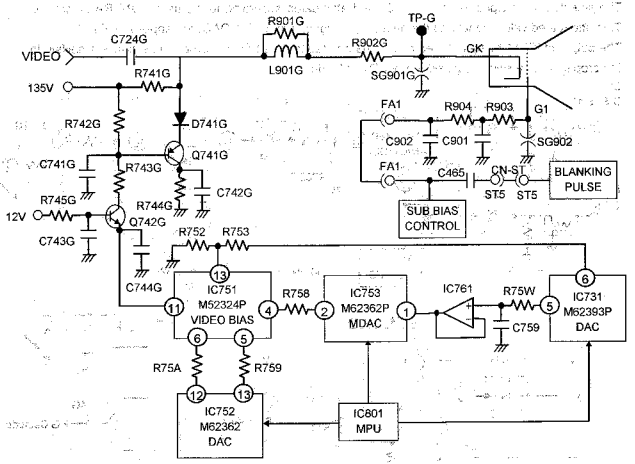
(Fig 1.1) Video Amplification Circuit

2) Brightness and Cut-off Control Section

The brightness and cut-off control section consists of the brightness control circuit (IC753 and IC731), the cut-off circuit (IC751 and IC752) and the cathode clamp circuit. For example, the green video circuit will be described here.

The user BRIGHTNESS control by IC801(MPU) determines the output voltage of IC753(MDAC) and IC752(DAC), the sink current to IC751 pin 11 being controlled and the current to the collector of Q742G accordingly. The clamp level is determined according to R742G voltage drop caused by this current deviation.

When a voltage of 2.5V_{DC} is applied to IC751 pin 13, the DC clamp level becomes the cut-off level.



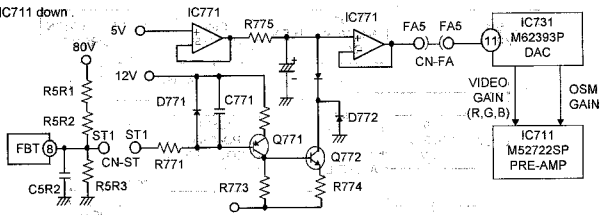
(Fig 1.2) Brightness and Cut-off Control

3) ABL Circuit

The ABL circuit consists of the part (Q771,Q772 and peripherals) which detects and amplifies the current flowing to the CRT anode, and the other parts (IC731 and IC711) which control the gain of the video signal (R,G and B) and the OSM signals.

The ABL circuit limits the amplitude of the video signal and serves to keep the maximum average current flowing to the CRT up to 500 μ A.

When the anode current is less than 500 μ A, the voltage of CN-ST pin 1 is clamped at 12.6V by D771. And the anode current attempts to exceed 500 μ A, the voltage drop of R5R1 and R5R2 causes the voltage of CN-ST pin 1 to be lower than 12.6V. The resultant voltage makes Q771 and Q772 operate and attenuate the input voltage of IC731, the output voltage of IC731 dropping thus bringing the gain of IC711 down.

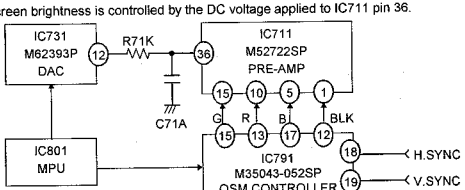


(Fig 1.3) ABL Circuit

4) On Screen Manager (OSM)

The OSM circuit consists of IC791(OSM controller) and IC711(Pre-amp) which mixes the video signal and the OSM signal.

IC791 receives the display data from IC801(MPU), the signal outputs(R,G,B and Blanking) are fed out of pins 13,15,17 and 12 respectively. The OSM signals are mixed with video signals in IC711(Pre-amp). The OSM screen brightness is controlled by the DC voltage applied to IC711 pin 36.



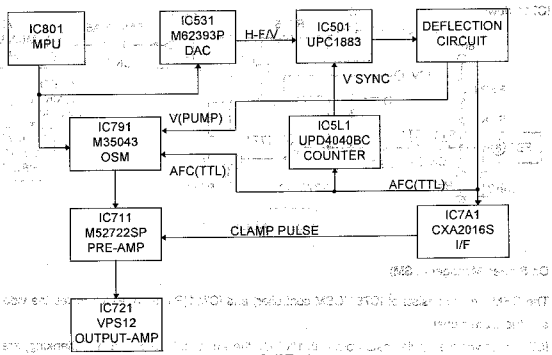
(Fig 1.4) On Screen Manager

5)Self Test

When the display is power off, power on while holding the RESET switch to enter the self test mode. When the self test mode is engaged, IC531(DAC) is controlled by IC801(MPU) to generate the voltage which makes IC501 to oscillate at 61.5KHz, thus the horizontal deflection circuit and the high voltage circuit operate at this frequency.

The pseudo vertical sync signal divided from the horizontal sync signal by IC5L1 and the shaped AFC pulse are fed to IC791,IC5L1 and IC7A1, the clamp pulse for IC711 is generated by IC7A1.

The video signal is generated by IC791, then fed to IC721(Output amp) via IC711(PRE-AMP).



(Fig 1.5) Self Test

2. DEFLECTION CIRCUIT

2-1. HORIZONTAL DEFLECTION CIRCUIT

1) Horizontal Oscillation Circuit

The control of the horizontal oscillation and horizontal image position is done by IC501 on the OSC PWB (PWE-470A).

The IC501 controls the following circuits as its internal functions.

- 1st delay circuit
- H-width circuit
- F/V delay circuit
- FBP delay circuit
- AFC circuit
- Horizontal duty control circuit
- Horizontal oscillation circuit (H-OSC)
- Horizontal Image Phase Shifter Circuit

1st delay circuit

The horizontal sync signal output from IC7A1 pin 18 on the VIDEO PWB is fed to pin 26 of IC501.

The horizontal sync signal input from pin 26 is delayed by this circuit.

The output signal delay is controlled by the input voltage of pin 25.

H-width circuit

The output signal of 1st delay is converted to the fixed pulse width signal (the Horizontal dummy sync signal) by this circuit.

The duty ratio of the pulse is fixed to 10%.

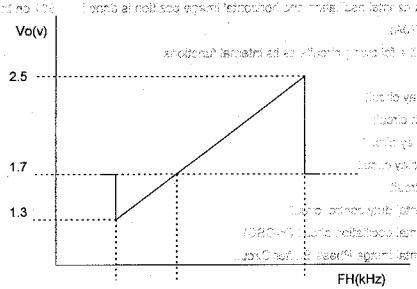
(Fig. 2-1)

F/V delay circuit

This circuit is an VCO(Voltage Control Oscillator).

An oscillator frequency is controlled by the input voltage of pin 19.

The control characteristic of the input voltage of pin 19 vs. an oscillator frequency is Fig.2-2.

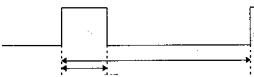


(Fig. 2-2)

FBP delay circuit

The FBP pulse input from pin 17 is delayed by this circuit, then supplied to AFC circuit.

The duty ratio of the FBP pulse is fixed to 30%.



(Fig.2-3)

AFC circuit

The AFC circuit detects the phase error between the horizontal dummy sync signal and FBP pulse input from pin 17 and uses this error voltage to control the horizontal oscillation.

Horizontal duty control circuit

The horizontal drive pulse is output from pin 18 and then supplied to the horizontal drive circuit.

The duty of horizontal drive pulse is controlled by the voltage of pin 23 so as to make the ratio approximately 48% without regard to the oscillation frequency.

Horizontal oscillation circuit (H-OSC)

The horizontal sync signal output from of IC7A1 pin 18 on the VIDEO PWB is fed to IC501 pin 26 on SUB PWB. Horizontal oscillation frequency is determined by the voltage applied to pin 19 and the current flowing out of pin 20.

The pulse(appox.8Vp-p) at the pin whose frequency is same as that of input sync signal, is output and applied to horizontal drive circuit. The duty ratio of the output pulse is regulated to approx.48% by the voltage applied to pin 23.

Horizontal Image Phase Shifter Circuit

The horizontal position of the picture is controlled by horizontal sync signal, the 1st delay output signal generated by charging and discharging the internal capacitor, FBP input and FBP delay output wave form generated by charging and discharging the internal capacitor. Therefore by varying the 1st delay quantity with the DC voltage applied to pin 25, the position of the picture is controlled.

Distortion Correction Circuit

Side Pincushion and Vertical Trapezoid Distortion Correction Circuit

The parabolic wave form that is the side pincushion and trapezoid distortion correction wave form output from IC501 pin 10 is supplied to the horizontal size control circuit on the MAIN PWB.

Its amplitude is controlled by side pincushion distortion correction control voltage input to pin 3 and its bias is controlled by vertical trapezoid distortion control voltage input to pin 2 of IC501.

Parallelogram Distortion Correction Circuit

The saw tooth wave form output from IC501 pin 28 is controlled by DC voltage input to pin 4.

Parallelogram distortion is corrected by this wave form input to pin 25(1st delay terminal) through C522.

When DC voltage input to pin 4 is approximately 2.5V, corrective value is 0V.

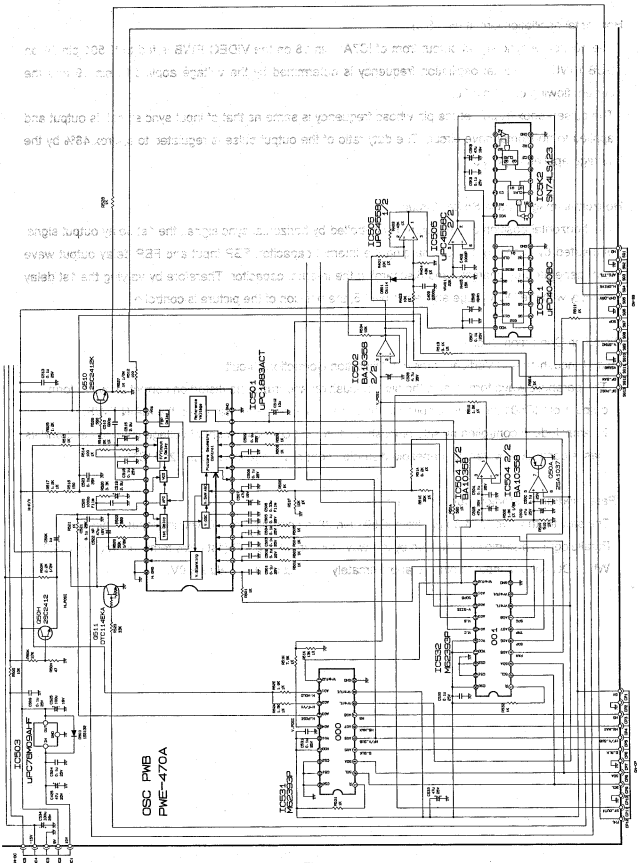


Fig. 2-4

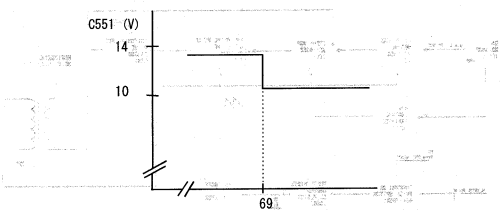
2) Horizontal Drive Circuit

The horizontal drive system uses what is generally referred to as a flyback system.

The horizontal drive pulse output from IC501 pin 18 on the OSC PWB and switches Q553 on and off.

It is amplified by T551 and switches Q554 (the horizontal output transistor) on and off.

The voltage of C551 for horizontal drive changes by the horizontal frequency as following and sets the optimum drive condition.



3) Horizontal Deflection Output Circuit

It corrects the optimum horizontal linearity by using Linear-coil and S collection capacitor to change the horizontal frequency mode.

Horizontal frequency mode is shown in CPU CIRCUIT.

Linear-coil of L581 change over boundary 49kHz. When operation frequency is higher than 49kHz, switches the Linear-coil of 4-5 pin on and 1-2 pin off.

On the other hand, if it is lower than 49kHz, switches the Linear-coil of 4-5 pin off and 1-2 pin on.

4) Horizontal Size Control Circuit

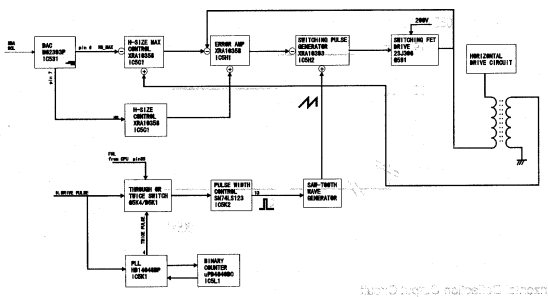
Using the PWM method to control the horizontal deflection frequency, horizontal size is controlled by DC-DC conversion of the power supply voltage for the horizontal deflection.

There are two types of horizontal size control. One is the H-SIZE for users, the other is the H-SIZE MAX used at the time of factory.

With the horizontal size control used by the user, the horizontal video size is set so that the image spreads across the entire front bezel (316mm) at all of the preset timing signals.

The horizontal size control consists of the following circuits;

- PLL and drive pulse generator
- Saw-tooth wave generator
- Switching pulse generator
- switching FET drive circuit
- Duty cycle controller



HORIZONTAL SIZE CONTROL CIRCUIT

Drive pulse frequency for saw-tooth wave is twice the horizontal frequency when the horizontal frequency operates from 31kHz to 49kHz.

When it operates higher than 49kHz, drive pulse frequency for saw-tooth wave synchronized with the horizontal frequency.

Using the PLL method (IC5K1), output pulse of IC5K1 pin 4 is made to twice frequency which input to pin 14 (deflection drive pulse).

Output frequency of IC5K1 pin 14 is controlled the voltage of IC502 pin 7 which is converted the horizontal frequency to correct voltage.

It is decided the voltage at IC801 pin 35 to whether twice frequency or not.

When the horizontal frequency is lower than 49kHz, voltage of IC801 pin 35 output 0 volt and drive pulse frequency is doubled by D5K1 on OSC PWB.

On the other hand, when it is higher than 49kHz, voltage of IC801 pin 35 output 5 volt and drive pulse frequency is same as horizontal by Q5K4.

The saw-tooth wave generator consists of Q5H2 and Q5H1 which are switched by the drive pulse. The slope of saw-tooth waveform is decide on charging current to C5H1, and it input to IC5H2 of pin 5. Also the voltage which is controlled the horizontal size is input to IC5H2 pin 6. By compare the two voltages, square wave is output from pin 7. The square wave is amplified and input to the gate of Q591, and convert the source voltage to a voltage for horizontal deflection that is proportional to the duty factor of gate input square wave.
The voltage is supplied to T561.

* User H SIZE control

OSM control for users vary from 0 to 255. At this time, the voltage of IC531 pin 7 (HS control line) vary from 5V to 0.88V, and the voltage of IC5H1 pin 5 vary from approximately 3V to 4V. The duty factor of IC5H2 pin 7 output square wave which is input to error amplifier IC5H1 pin 5 changes and the horizontal size varies. The horizontal video size shrinks as much as approximately 77% irrespective of the horizontal frequency when the maximum size is taken to be 100%.

* H SIZE MAX control

The H SIZE MAX control is service mode only. This control set the maximum horizontal size. The H SIZE for user control vary from the horizontal maximum size which is adjusted at this stage to less than the maximum adjustment.
H SIZE MAX control vary from 0 to 255 on OSM menu, and the voltage of IC531 pin 6 output voltage vary from approximately 0.88V to 5V. The horizontal maximum size control voltage (VCAO) is output that it is compared to the voltage which is corrected AFC pulse (IC5C1 pin 12) with the maximum size control voltage (IC5C1 pin 13).
The VCAO output voltage is converted to the slice voltage of comparator for PWM control which is input to error amplifier IC5H1 pin 6.

5) Distortion Correction Circuit

The distortion correction circuit creates a distortion correction signal to reduce the geometric distortion intrinsic in the CRT, and this signal is modulated by the phase and deflection circuit.

The correction wave is generated inside IC501;uPC1883 on the OSC PWB.

The distortion correction wave is roughly divided into horizontal size and horizontal phase circuit.

* Horizontal Size correction Circuit

(1) Side pin correction (SDP)

(2) Trapezoid correction (TRP)

(3) Corner distortion correction (CORNER)

When the user performs the OSM menu of geometric horizontal frequency system correction, the input voltage of IC501 pin 3, pin 2, and pin 1 vary in a range of 1V to 4V. After computation inside the IC, the correction wave of the computation results is output to pin 10 SDP. Then this waveform amplitude is controlled by sub H_F/V which convert the horizontal frequency to voltage and the horizontal size at op-amp inside IC4A1.

This control is performed in the multiplier (IC4A1).

The output amplitude of IC4A1 pin 6 is half as much as multiple pin 5 SDP by pin 4 voltage.

Following this output is added to the horizontal chopper duty control section, and finally it is modulated to the power supply voltage used for horizontal deflection and applied to the raster correction.

* Horizontal Phase correction Circuit

(1) Side pin balance correction (SDPB)

(2) Parallelogram correction (PAR)

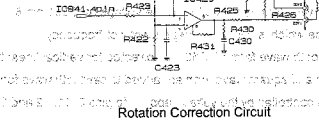
Similarly, when the user performs the geometric horizontal phase system correction, the input voltage of IC501 pin 5 (SDPB) and pin 4 (PAR) varies in a range of 1V to 4V. Then, after computation inside the IC, the correction wave of the computation results is output to pin 28 (HPDO). The correction wave is added to the DC voltage of pin 25 (HP), and phase correction using the IC501 horizontal delay function is performed.

6) Rotation Correction Circuit

Raster rotation is corrected by moving the electron beam in the magnetic field produced by current applied to the Z-coil. The amount of correction is proportional to the current applied to the Z-coil and so the correction can be adjusted with the control voltage (DC) of the D/A converter.

The DC voltage output from IC961(D/A converter) pin 4 generates current to flow in the Z coil to change, and amount of rotation is determined.

User can adjust the level of rotation by operating OSM menu(Rotate).



Rotation Correction Circuit

7) H Centering Circuit

Switching regulator generates the floating 5 volts which is compared to the deflection circuit power supply voltage (high B+ voltage). This voltage is divided by VR581 (H centering) and is supplied to the base of Q584. The voltage differences of Q584's base and emitters is supplied to L583.

Horizontal centering is manipulated by the current supplied by L583 to the horizontal deflection circuit.

2-2. VERTICAL DEFLECTION CIRCUIT

The vertical deflection circuit consists of the following blocks:

1) Sawtooth wave form generating and wave form corrective section.
2) Vertical raster position control section.
3) Vertical output amplifier section

1) Sawtooth Wave Form Generating and Wave Form Corrective Section

The vertical sync signal from IC7A1 on VIDEO PWB (PWE-469A) is fed to IC501 pin 27 (uPC1883ACT) on OSC PWB (PWE-470A), so that the sawtooth wave form synchronized with the input signal is output from IC501 pin 9.

The amplitude of sawtooth wave form is controlled by the voltage at IC501 pin 8.

IC501 controls the amplitude which is constant independently of frequency.

In addition, the output sawtooth wave form of IC501 is corrected for vertical linearity.

In IC501, square wave form and square wave form are added to sawtooth wave form to correct linearity.

The amount of correction is controlled by the voltage applied to pins 8, 11, 12 and 13 (vertical size pin 8, vertical position pin 11, S correction pin 12 and C correction pin 13).

The voltage at pins 12, 13 are D/A converter output.

As a result, the optimum linearity can be obtained even as the vertical size and vertical position are changed.

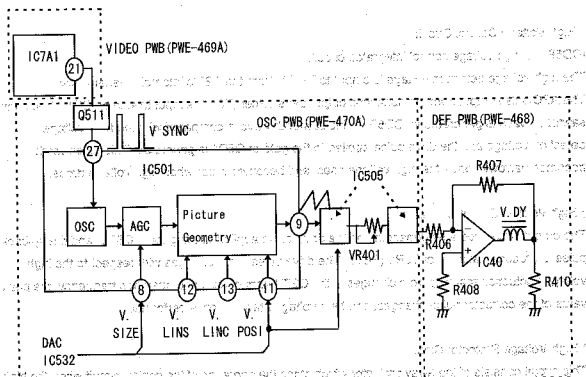
2) Vertical Raster Position Control Section

The vertical raster position is controlled by changing the amount of DC bias of the input signal to IC401.

IC505 subtract the voltage at IC501 pin 11(vertical position voltage) from the voltage at IC501 pin 9 (sawtooth wave form output), and then the amount of DC bias of the input signal to IC401 is changed.

3) Vertical Output Amplifier Section

The current proportional to the input voltage to IC401 is supplied to the vertical deflection coil (V-DY). The vertical deflection current is taken as voltage wave form by R410 and feedback to IC401.



Vertical Deflection Circuit

3. HIGH VOLTAGE CIRCUIT

The high voltage circuit consists of the high voltage control circuit, and Q5P1 and its peripheral circuits made up for the high voltage output circuit and the high voltage protection circuit for instance of high voltages circuit irregular operation.

1) High Voltage Control Circuit

ICD5P1 is high voltage control integrated circuit.

The high voltage detection voltage is output to TP-HV from the FBT's internal bleeder resistor.

The AFC pulse output from the horizontal output transformer (T561) is input to 4pin of ICD5P1, and the sawtooth wave is generated in ICD5P1. This sawtooth wave is compared with the high voltage detection voltage and the drive pulse applied to the gate of Q5P1 is generated. This pulse width becomes narrower when the high voltage rises, and becomes wider when high voltage drops.

2) High Voltage Output Circuit

The output circuit operates depending on the drive pulse applied to the gate of Q5P1, and the fly-back pulse is produced at pin 1 of T5R1 (FBT). The drive pulse width changes with respect to the high voltage fluctuation resulting from changes in the CRT beam current and operation frequency, the peak value of the corrector pulse changes, and high voltage stabilization is performed.

3) High Voltage Protector Circuit

This circuit consists of the X-ray protector which stops the operation of the control circuit when the high voltage rises abnormally, and the overcurrent protector which operates when the current flowing into FBT (T5R1) has increased.

Once the X-ray protector and the over current protector have started operation, their operation is not canceled unless the power supply is switched off, and then on again.

*X-ray protector

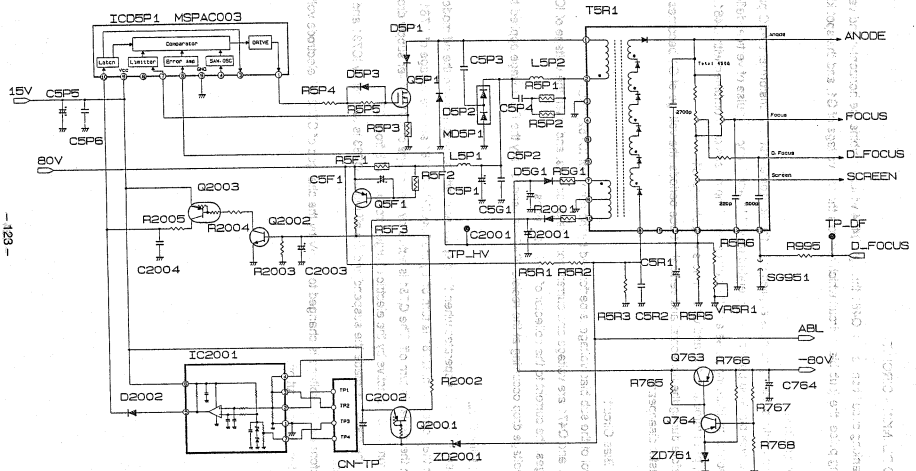
When the high voltage rises, the voltage of T5R1 (FBT) pin 10 rises. This voltage is compared with the reference voltage in IC2001, and when the reference voltage is exceeded, the comparator operates and output voltage of IC2001 (5pin) is high level, then the operation of the high voltage control circuit is stopped.

*Overcurrent Protector

When the current flowing into T5R1 (FBT) pin 2 increases, Q5F1 operates and Q2002 is switched on. Also when the current flowing into T5R1 (FBT) pin 8 increases, Q2001 operates and Q2002 is switched on. When Q2002 is switched on, Q2003 is switched on and the voltage of ICD5P1 10pin rises. Then latch circuit inside ICD5P1 operates and the high voltage control circuit is stopped.

While the protector circuit is operating, the voltage of ICD5P1 pin 3 is approx. 2V.

HIGH VOLTAGE CIRCUIT AND PROTECTOR CIRCUIT



4. VIDEO BLANKING CIRCUIT

The blanking circuit consists of Q461 through Q464 which combine the horizontal and vertical blanking pulse, the (sub bias) circuit which controls the DC voltage of G1, and the spot killer circuit.

1) Blanking Circuit

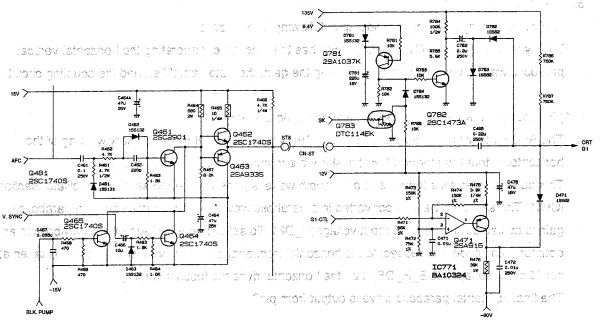
The horizontal blanking pulse is applied from the horizontal output transformer's AFC pulse.
The vertical blanking pulses are generated by IC7A1 and pump-up pulse of vertical deflection circuit.
The horizontal blanking pulse and the vertical blanking pulses are combined with Q461,Q464 and Q465, pass through Q462 and Q463, and are applied to G1.
Therefore during the horizontal and vertical retrace periods, the voltage of G1 becomes low and then the raster disappeared.

2) Sub Bias Circuit

Control of the sub bias voltage is performed by the output of IC752(DAC).
IC771 and Q471 are voltage and current conversion circuits, and when the voltage of IC752 pin 4 changes, the current to the collector of Q471 changes.
The voltage drop occurring at the resistor R476 is used to vary the DC voltage applied to G1.

3) Spot Killer Circuit

The spot killer circuit operates when the display turns off, the suspend and the off modes.
When the power is on, Q781 is turn off by the 9.4VDC of C781 and the voltage of C781 is 135V.
When the display is turn off. The Q781 is active by the voltage of 9.4V power supply dropping.
Therefore Q782 is active by the electric charge through R783 from C781.
When the display is made the suspend and the off mode, Q783 is turn off by IC731 and Q782 is turn on.
Therefore the G1 voltage is changed to -135V by the changed of C782 "+" electrode voltage.
Then the raster is cut off.



(Fig 4.1) Blanking Circuit

5. DYNAMIC FOCUS CIRCUIT

The dynamic focus section is made up of following three blocks:

The dynamic focus (D-FOCUS) IC (IC951) has the function of generating the horizontal/vertical parabolic wave as well as that of controlling the gain, the outputamplifier, and the coupling circuit.

1) Horizontal Parabolic Wave Generation and Gain Control Circuit

The AFC pulse which is generated by the FBP(fly back pulse) of the secondary winding of the horizontal output transformer(T561) is shaped and input to IC951 17pin(AFC_TTL).

This pulse is used as a trigger and a sawtooth wave is generated at the sawtooth oscillator section in IC951. The sawtooth wave is converted to a parabolic wave at the X^2 circuit and the parabolic wave gain is adjusted with the pin 6 input voltage(H_DF). To set the peak voltage of this parabolic to an optimum amplitude with respect to the horizontal frequency and horizontal size, tracking is taken at the pin 19 input voltage(SUB_H_DF), i.e., the horizontal dynamic focus voltage.

The final horizontal parabolic wave is output from pin7.

2) Vertical Parabolic Wave Generation and Gain Control Circuit

The vertical sawtooth wave produced by the oscillator IC (IC501) is input to IC951 pin 2 (DF_SAW) and is converted to a parabolic wave in the X^2 circuit in IC951.

The gain of this parabolic wave is controlled by the pin 5 input voltage(V_DF), i.e.,the vertical dynamic focus voltage. The result is output to pin 4.

3) Output Amplifier Circuit and Coupling Circuit

The horizontal and vertical parabola waveforms are generated at IC951 and are clamped before each output circuit for wide dynamic range of the output circuit.

The clamp voltage is determined by the voltages of ZD981 and ZD982.

After the clamp circuit, the horizontal parabola waveform is amplified by Q981. The output waveform at Q981 is input to T981 via the buffer circuit which is comprised of Q982, Q983, Q984 and Q985.

The gain of T981 is approximately 8.

The vertical parabola waveform is amplified by Q987. The output waveform at Q987 modulates the secondary winding of T981 as the vertical parabola waveform. Therefore, T981 outputs the horizontal parabola waveform which is modulated by the vertical waveform.

This modulated waveform is input to the CRT focus grid via the built-in capacitor of T5R1(FBT).

DYNAMIC FOCUS CIRCUIT
ANODE
FOCUS
D_FOCUS
SCREEN
T551
SG551
FB_DF
R565
T581
C583
R589
R588
C585
Q584
Q585
200V
R591
Q587
ZD581
R592
R590
D584
D585
C586
80V
Sync pulse
Vertical
L582
80V
R583
C584
C582
R582
Q582
Q583
R586
C587
C588
C589
R585
R584
C581
R581
ZD582
C572
C571
C573
C574
15V
SUB_DF
AFC
TC582
LB51
C562
C564
R564
TC581
KE223SP
C563
DF_SAW
DF
V_DF
I

6. CPU CIRCUIT

1) CPU

IC801 : 8 bit CPU / CMOS IC

IC802 : EEPROM / CMOS IC

This system has the following functions.

Frequency Counter

fH band

Degaussing Control

DAC control (see 2. DC Control Circuit)

PMS control (see 3. Power Management system (PMS) Circuit)

OSD control (see 5. User Control Operation)

a. Frequency Counter

IC801 counts Horizontal frequency by event counter, Vertical frequency by interval timer. Horizontal sync is negative input to IC801 pin 12. Vertical sync is positive input to IC801 pin 44.

Sync range

Horizontal	31.0 - 94.0 kHz
Vertical	55.0 - 160 Hz

If Horizontal frequency is less than 1 kHz or Vertical frequency is less than 10 Hz, IC801 judges "NO PULSE". And IC801 enters to "PMS MODE".

b. Fh Band

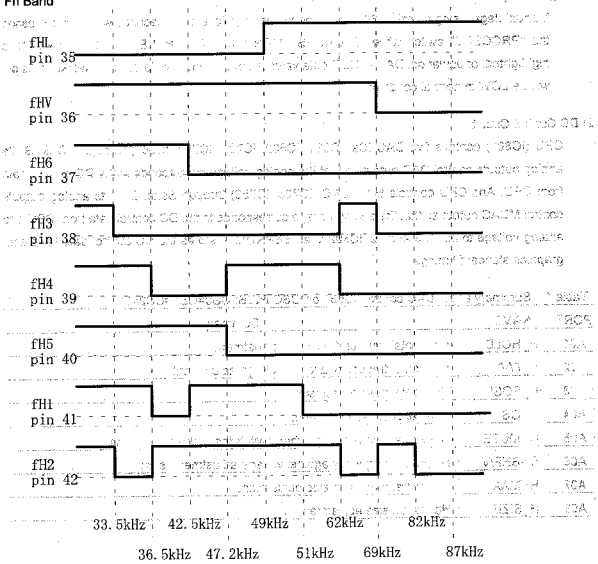


Fig1 Output fh Band status (IC801)

Attention : Fh 1 to 6 Band signals are output for horizontal output circuit control to keep the horizontal linearity constant. Fh V signal is output for horizontal output circuit control to keep the drive condition and be output for SW reg. circuit control to keep the output voltage constant. Fh L signal is output for horizontal output circuit control to keep the horizontal linearity constant and be output for video clamp circuit control to switch the clamp pulse width.

c. Degaussing Control

Manual degaussing signal. IC801 pin 61 becomes High level for 3 seconds when user presses the "PROCEED" switch while "DEGAUSS" (MENU(u) - "BRIGHTNESS & CONTRAST") is highlighted, or power on. DAC - "TILT" data value is set to center, while degauss works. This pin will be LOW in normal condition.

2) DC Control Circuit

CPU (IC801) controls five DAC ICs (IC531, IC532, IC731, IC752, IC961) through I^2C BUS. Its analog outputs control DAC output so that the analog voltage corresponds to the DC control data from CPU. And CPU controls two MDAC (IC703, IC753) through Serial Bus. Its analog outputs control MDAC output so that the analog voltage corresponds to the DC control data from CPU and analog voltage to pin 1, 3 and 12. IC802 is an EEPROM. It stores the DC control data for preset graphics standard timings.

Table 1 Summary about DAC control (IC531 on OSC PWB: CS0=CS1=CS2=0)

PORT	NAME	Summary
A01	H_HOLD	Horizontal free-run frequency adjustment
A02	H_F/VI	Horizontal frequency against voltage adjustment
A03	H_POSI	Horizontal position adjustment
A04	VPOSI	Vertical position adjustment
A05	HSMUTE	Horizontal size protector when switch the ambient condition.
A06	SUBHF/V	Horizontal frequency against voltage adjustment (sub)
A07	HSMAX	Horizontal maximum size adjustment
A08	H_SIZE	Horizontal size adjustment

Table 2 Summary about DAC control (IC532 on OSC PWB: CS0=1 CS1=CS2=0)

PORT	NAME	Summary
A01	SDPB	Side Pin Balance adjustment
A02	V_SIZE	Vertical size adjustment
A03	VLS	Vertical linearity balance adjustment (center - top/bottom)
A04	VLC	Vertical linearity balance adjustment (top - bottom)
A05	PAR	Parallelogram adjustment
A06	SDP	Side Pin adjustment
A07	TRP	Trapezoid adjustment
A08	CORNER	Corner distortion adjustment

Table 3 Summary about DAC control (IC731 on CRT PWB: CS0=CS1=1 CS2=1)

PORT	NAME	Summary
A01	OSD ADJ	OSD brightness adjustment
A02	R GAIN	Video R swing voltage adjustment
A03	G GAIN	Video G swing voltage adjustment
A04	B GAIN	Video B swing voltage adjustment
A05	CONTRAST	User CONTRAST control
A06	BRIGHT	User BRIGHTNESS control
A07	CUT_OFF	Switch the CUT OFF mode
A08	SPOTKILL	Spot killer circuit control

Table 4 Summary about DAC control (IC752 on CRT PWB: CS0=1 CS1=0 CS2=1)

PORT	NAME	Summary
A01	G_BIAS	Back raster color balance adjustment
A02	G_SBRT	Brightness tracking adjustment
A03	R_BIAS	Back raster color balance adjustment
A04	R_SBRT	Brightness tracking adjustment
A05	G1C	Back raster brightness adjustment
A06		
A07	B_BIAS	Back raster color balance adjustment
A08	B_SBRT	Brightness tracking adjustment

Table 5 Summary about DAC control (IC961 on DF PWB: CS0=0 CS1=1 CS2=0)

PORT	NAME	Summary
A01	HDF	Horizontal Dynamic Focus adjustment
A02	VDF	Vertical Dynamic Focus adjustment
A03	SUB_HDF	Horizontal Dynamic Focus control
A04	MOIRE	Moire Canceller level adjustment
A05	TLT	Display tilt (raster rotation) adjustment
A06		
A07		
A08		

Table 6 Summary about MDAC control (IC703 on VIDEO PWB)

PORT	NAME	Summary
R	Color Gain R	Accu Color control
G	Color Gain G	Accu Color control
B	Color Gain B	Accu Color control

Table 7 Summary about MDAC control (IC753 on CRT PWB)

PORT	NAME	Summary
R	Brightness R	Accu Color tracking control
G	Brightness G	Accu Color tracking control
B	Brightness B	Accu Color tracking control

3) Power Management System (PMS) Circuit

PMS circuits reduce power consumption. They have 3 modes of stand-by, suspend and off.

Table 8 PMS Mode (IC801)

Mode	Pin 33	Pin 34	Pin 26
	PMS_SUS#	PMS_OFF	POWER LED
On	High	Low	High
Stand-by	High	Low	High
Suspend	Low	Low	Pulse(1KHz)
Off	Low	High	Low

a.Stand-by Mode

When the horizontal sync is not input, this monitor enters stand-by mode in a few seconds.

IC801 controls IC791(OSD IC). Then video signal of IC711 pin 25, 30, 35 stop by blank pulse IC791 pin 12.

When the horizontal sync is input, this monitor returns to normal operation mode with the shortest recovery time.

b.Suspend Mode

When the vertical sync is not input, this monitor enters suspend mode in a few seconds.

IC801 outputs pulse(1kHz) from pin 26. Because Q101 and Q102 toggle on-off alternately, LED101 looks yellow.

IC801 pin 33 outputs low so as to operate each power saving circuit.

Power saving circuit consists of saving circuit for +80V, that for +5V, that for F5V and that for ±15V.

When the vertical sync is input to this monitor, monitor operates normally with longer recovery time than stand-by Mode.

c.OFF mode

When the horizontal sync and vertical sync are not input, this monitor enters off mode in a few seconds. IC801 pin 34 becomes high, then PC601 turns on, therefore switching regulator circuit stops.(Then pin 34 of IC801 becomes low.)

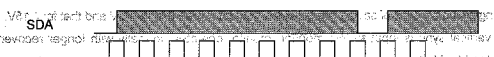
When the horizontal sync is input, Q6F3 turns on and outputs pulse. And as PC602 turns on, switching regulator circuit restarts.

4) Plug and Play (DDC 1 / 2)

VESA Display Data Channels (DDC)

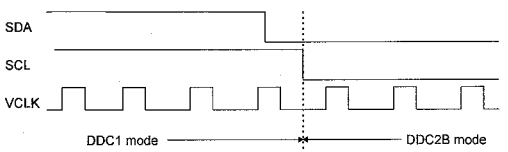
a. DDC1

When the monitor is turned on at the first time, the operation mode starts in DDC1 mode. When the VCLK (SYNC) is provided to IC8A1 pin 7, serial data stream is generated from the IC8A1 pin 5 by synchronizing with the rising edge of the VCLK. The contents of the serial data (SDA) is called EDID, and it contains the information of monitor's specification and supported signals. The EDID is composed of 8 bits, 128 bytes, but the individual data is composed of 9 bits. The 9th bit is always low and is ignored. If 128 bytes are finished to generate, then the 24LCS21 starts to generate the first byte. This operation lasts continuously until the operation mode changes to DDC2B.



b. DDC2B

When the SCL (IC8A1 pin 6) input is changed from high to low, the operation mode changes from DDC1 to DDC2B. The output data is the same as DDC1 (EDID), but the communication protocol is different. In DDC2B mode, the serial data is communicated by I^2C-bus protocol. The operation mode never go back from DDC2B to DDC1 except by turning off the monitor.



5) User Control Operation

User Control Interface (IC801)

Table 8 Input (IC801)

Pushed SW	pin 18	pin 19	pin 20	pin 21	pin 22	pin 23	pin 24
EXIT	High	Low	Low	Low	Low	Low	Low
-	Low	High	Low	Low	Low	Low	Low
▼	Low	Low	High	Low	Low	Low	Low
▲	Low	Low	Low	High	Low	Low	Low
+	Low	Low	Low	Low	High	Low	Low
PROCEED	Low	Low	Low	Low	Low	High	Low
RESET	Low	Low	Low	Low	Low	Low	High

OSD

This model is adjusted through OSD (On Screen Display ; it is called OSM^{TM} in USA), by operating Control Panel. It is located on the lower left corner of front panel.

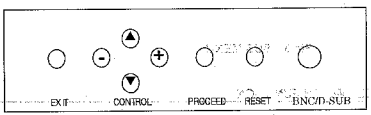


Fig. 2 Control Panel

OSM MENU structure is as below. (It is structured "TAB", "SUB MENU")

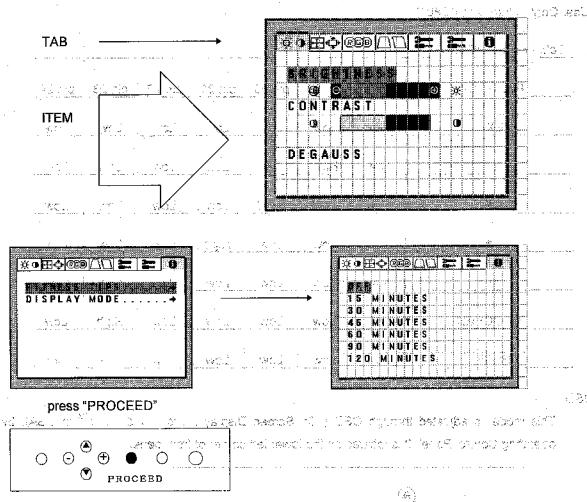


Fig 3 SUB MENU

Table 9 USER CONTROL SWITCH FUNCTION

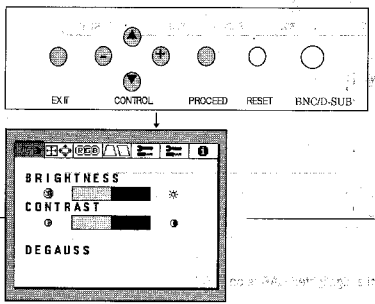
MENU	KEY	"EXIT"	"−"	"+"	"▲"	"▼"	"PROCEED"
TAB	TAB		○	○			
TAB	ITEM					○	
ITEM	SUBMENU						○
ITEM	ITEM				○	○	
SUBMENU	ITEM	○					
ITEM	TAB	○			○*	○**	
ALL ITEM	TAB	○					

* : Valid only highlighted bar is on top ITEM

** : Valid only if highlighted bar is on bottom ITEM

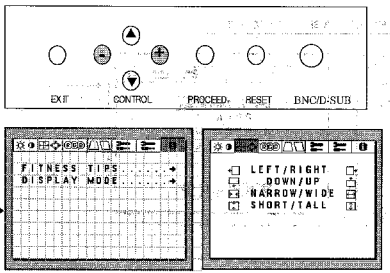
How to display OSM MENU

MENU(u) : Press "EXIT" or "−", "+", "▲", "▼", "PROCEED" once when OSM MENU is not displayed.

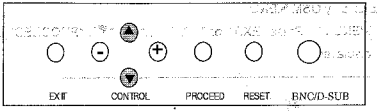


How to change TAB

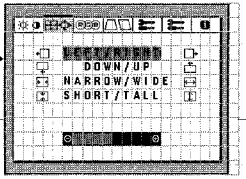
press "−" OR "+" switch while highlighted bar is on TAB



Select ITEM



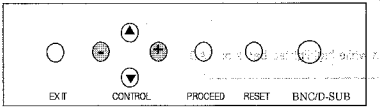
Press "▲" or "▼" switch



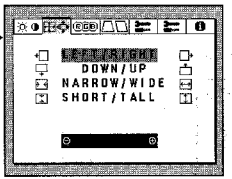
"▼"

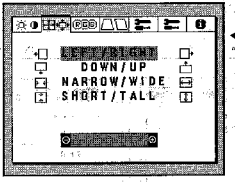
Change data value

Press "−" or "+" switch while highlighted BAR is on ITEM



"−"

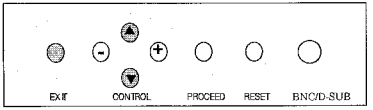




"+"

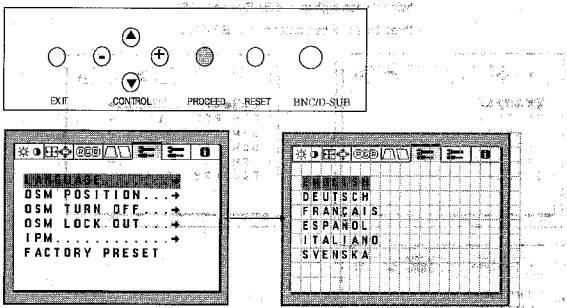
Save DATA value to memory

Move highlighted BAR to other "ITEM" or "TAB" (press "EXIT" or "▼", "▲")



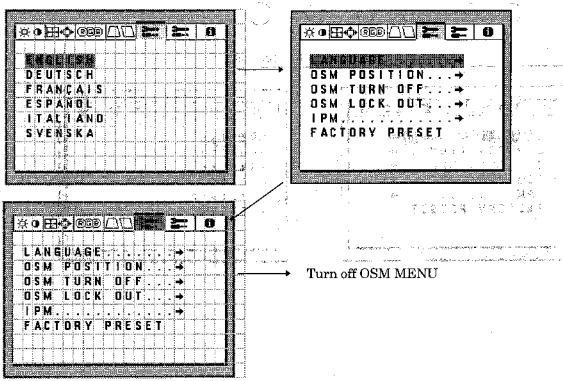
6) Open SUB MENU

Press "PROCEED" switch when the "ITEM" highlighted that contains "→"



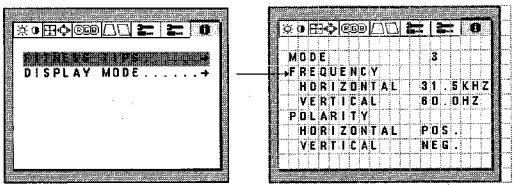
7) Turn off OSM MENU

Press "EXIT" switch once : when highlighted BAR is on "TAB"
twice : when highlighted BAR is on "TAB"
three times : when entering "SUB MENU"

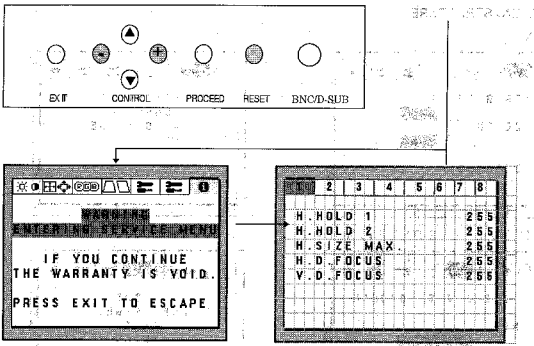


8) Open MENU(s)

Open menu "INFORMATION" - "DISPLAY MODE"



then press "RESET" and "+", "−" switch at same time



A warning message will be displayed, then press "PROCEED"

OSM MENU STRUCTURE

1. MENU(u)

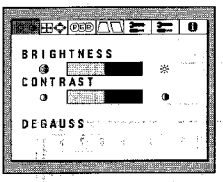


Fig. 4 MENU(u) - "BRIGHTNESS&CONTRAST

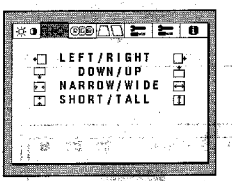


Fig. 5 MENU(u) - "SIZE & POSITION"

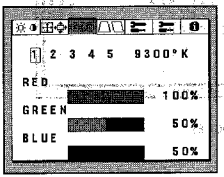


Fig. 6 MENU(u) - "RGB"

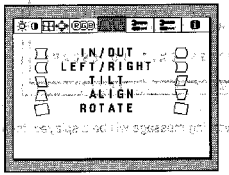


Fig. 7 MENU(u) "GEOMETRY"

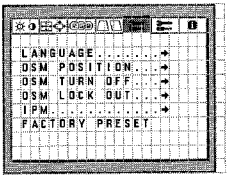


Fig. 8 MENU(u) - "TOOL1"

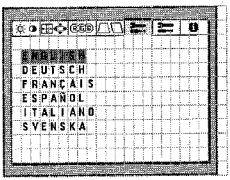


Fig 9. SUB MENU(u) - "LANGUAGE"

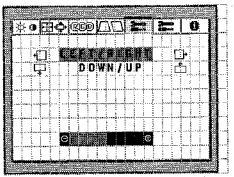


Fig. 10 SUB MENU(u) - "OSM POSITION"

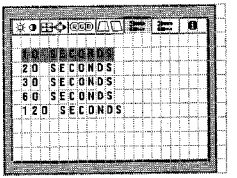


Fig 11 SUB MENU(u) - "OSM TURN OFF"

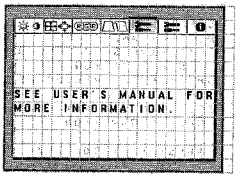


Fig. 12 SUB MENU(u) - "OSM LOCK OUT"

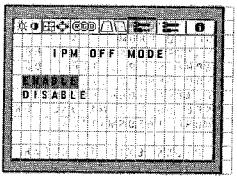


Fig.13 SUB mENU(u) - "IPM"

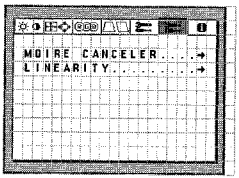


Fig.14 MENU(u) - "TOOL2"

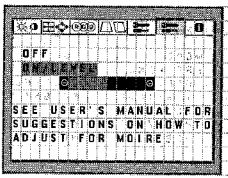


Fig.15 SUB MENU(u) - "MOIRE CANCELER"

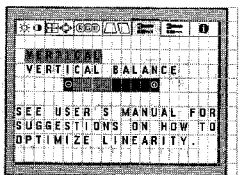


Fig. 16 SUB MENU(u) - "LINEARITY"

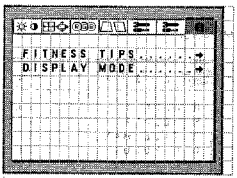


Fig. 17 MENU(u) - "INFORMATION"

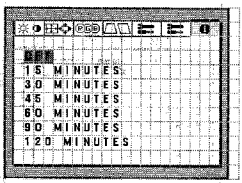


Fig 18 "FITNESS TIPS" setting

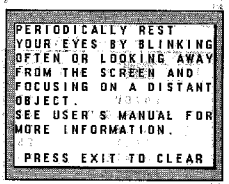


Fig 19 "FITNESS TIPS" MESSAGE - 1

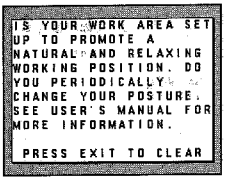


Fig 20 "FITNESS TIPS" MESSAGE - 2

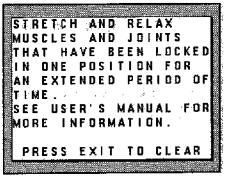


Fig 21 "FITNESS TIPS" MESSAGE - 3

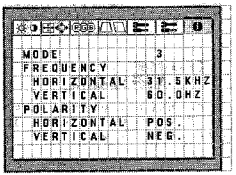


Fig 22 "DISPLAY MODE"

2. MENU(s)

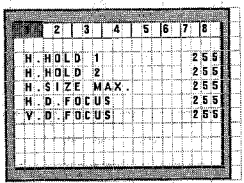


Fig. 23 MENU(s) - TAB1

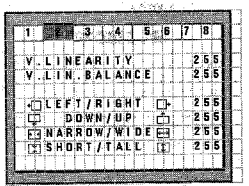


Fig. 24 MENU(s) - TAB2

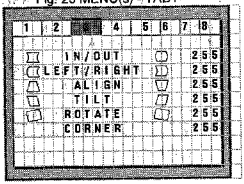


Fig. 25 MENU(s) - TAB3

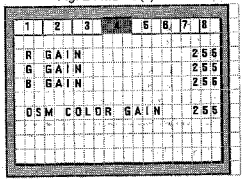


Fig. 26 MENU(s) - TAB4

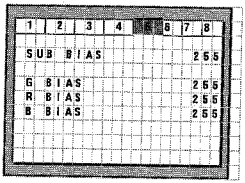


Fig. 27 MENU(s) - TAB5

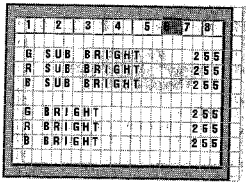


Fig. 28 MENU(s) - TAB6

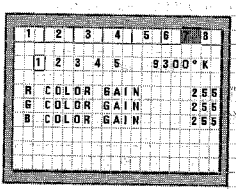


Fig. 29 MENU(s) - TAB7

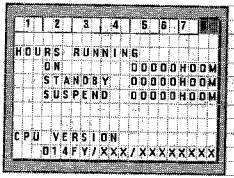
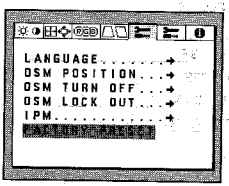


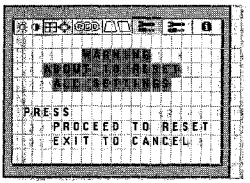
Fig. 30 MENU(s) - TAB8

Factory Preset

Open Menu(u) - "TOOL1", then move highlighted BAR to "FACTORY PRESET"



"Warning message" will be displayed, when "RESET" switch is pressed.



All user setting are to "FACTORY PRESET" value whe "PROCEED" switch is pressed.

Table 10 FACTORY PRESET

TAB	ITEM	preset value
BRIGHTNESS & CONTRAST	BRIGHTNESS	MINIMUM
	CONTRAST	MAXIMUM
	DEGAUSS	---
SIZE & POSITION	ALL ITEMS	SET TO FACTORY PRESET
RGB	12345	NO. 1
	RED, GREEN, BLUE	SET TO FACTORY PRESET
GEOMETRY	ALL ITEMS	SET TO FACTORY PRESET
TOOL1	LANGUAGE	NO CHANGE
	OSM POSITION	SET TO FACTORY PRESET
	OSM TURN OFF	30 SECONDS
	OSM LOCK OUT	---
	IPM	NO CHANGE
TOOL2	MOIRE CANCELER	MODE : OFF LEVEL : MINIMUM
	LINEARITY	SET TO FACTORY PRESET

FITNESS TIPS

How to confirm "FITNESS TIPS" message.

1) Open SUB MENU(u) - "INFORMATION" - "FITNESS TIPS"

2) Press "+" and "－" switch together, then message will be displayed.

3) Press "＋" switch, then message will change.

4) Press "＋" switch, then message will change.

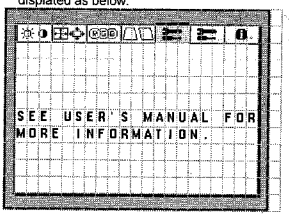
5) Press "＋" switch, the SUB MENU(u) - "INFORMATION" - "FITNESS TIPS" will be displayed.

OSM LOCK OUT

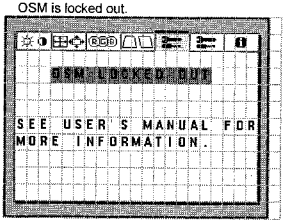
1) Open MENU(u) -"TOOL1"

2) Move highlighted BAR to "OSM LOCK OUT"

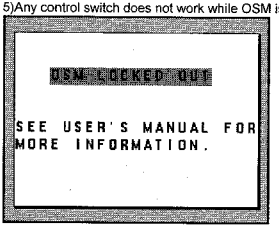
3)Press "PROCEED" switch while "OSM LOCK OUT" is highlighted, then message will be displated as below.



4) Press "▲" and "PROCEED" switch together, then message will be displayed as below, and OSM is locked out.



5)Any control switch does not work while OSM is locked out. And message is displayed as below



6) To unlock "OSM LOCK OUT", press "▲" and "PROCEED" switch together when the above message is displayed.

7. MOIRE CANCELLER

The timing pulse is outputted from IC 5L1 pin 7. Its frequency is half of the horizontal frequency. ($\frac{horizontal\ \ frequency}{2}$)

And the timing pulse is added to the level shift circuit (R50G, R50K, R50H) through Q50G.

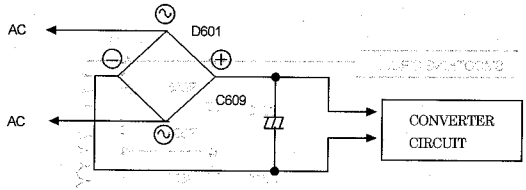
The output voltage from level shift circuit is controlled by DAC output voltage from IC961 pin 15.

And its voltage is added to C50K through the current amplifier (Q50H).

8. SWITCHING REGULATOR CIRCUIT

1) Rectifying and Smoothing Circuit

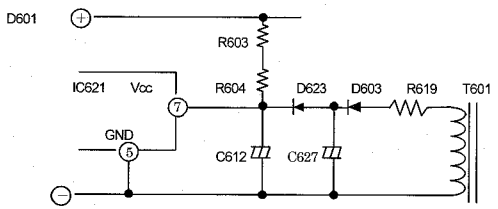
AC input is rectified by D601. Then, it is smoothed by C609.
The resulting DC voltage is supplied to the converter circuit.



Rectifying and Smoothing Circuit

2) Auxiliary Power Supply Circuit

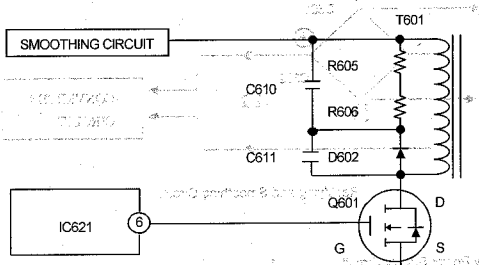
The auxiliary power supply circuit is needed to activate IC621.
When the power switch is turned on, the charging current flows into the capacitor C612 through R603 and R604. Oscillation starts when the voltage of IC621 pin 7 reaches 17V by this charging operation.
After the start of oscillation, the fly-back voltage of the auxiliary winding of T601 is rectified and smoothed by D603, D623,C612 and C627 .
The resulting DC voltage is supplied to IC621 pin 7.



Auxiliary power Supply Circuit

3) Converter Circuit

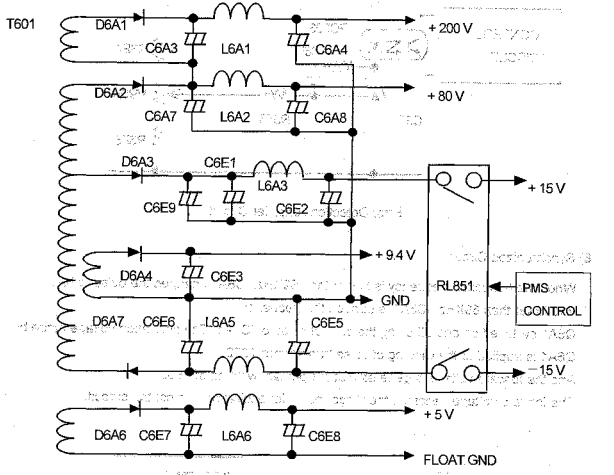
The converter circuit consists of the primary winding of T601, a switching device Q601 and surge absorbers (C610,C611,R605,R606, and D602) which are connected to the primary winding of T601. The oscillating signal from IC621 pin 6 is applied to the gate of Q601 so that the drain-source is turned ON and OFF. In result, the oscillating voltage is applied to the primary winding of T601.



Converter Circuit

4) Output Rectifying and Smoothing Circuit

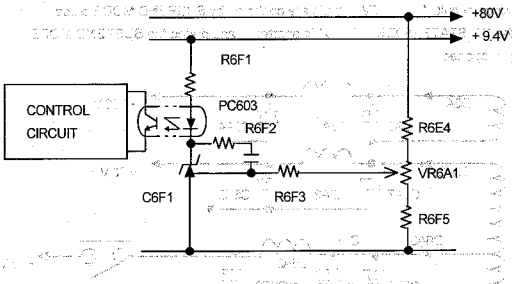
The fly-back voltages which are generated at the secondary windings of T601 are rectified by D6A1,D6A2,D6A3,D6A4,D6A6 and D6A7. Then, these voltages are smoothing by C6A3,C6A4, C6A7,C6A8,C6E1,C6E2,C6E3,C6E5,C6E6,C6E7,C6E8 and C6E9 so DC voltages are obtained. The DC voltages are maintained constantly by controlling the ON period duty cycle of Q601 in the converter circuit. And, ±15V outputs are controled by SUSPEND MODE pulse.. During the ON STATE MODE, RL851 is shorted. and during the SUSPEND MODE, the relay is opened.



Output Rectifying and smoothing Circuit

5) Error Detection Amplifier Circuit

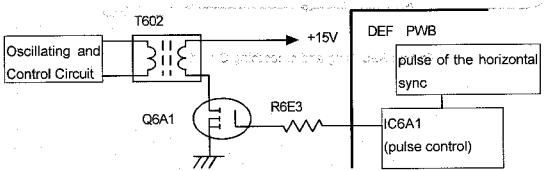
The output voltage 80V is divided by the resisters. (R6E4, R6F5 and VR6A1)
This divided voltage is compared with the reference voltage at the error amplifier IC6F1.
An error signal is applied to the control circuit via the photocupler PC603.



Error Detection Amplifier Circuit

6) Synchronized Circuit

When the horizontal frequency is higher than 69KHz, IC6A1 changed the pulse to half .
And lower than 69KHz, IC6A1 is through the frequency.
Q6A1 switched on and off using the out-put pulse of IC6A1. The oscillation voltage made by Q6A1 is applied to the winding of pulse transformor T602.
And the forward voltage is genereted at the primary winding of T602
The forward voltage becomes the trigger pulse for oscillating and control curcuit.



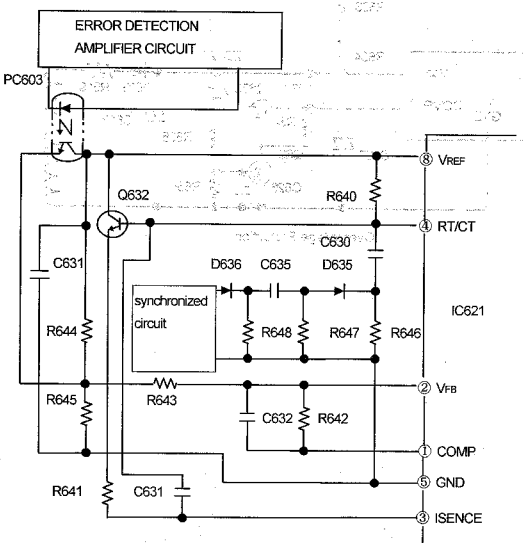
Synchronized Circuit

7) Oscillating and Control Circuit

The oscillating and control circuits are contained in IC621. IC621 has a built-in oscillator whose frequency is determined by R640 and C630 which are connected to pin 4 and pin 8 respectively. And when the pulse of the horizontal sync or half . Signal is applied to R646, the switching frequency is synchronized with the horizontal frequency or half .

The pulse of the horizontal sync or half is made by synchronized circuit .

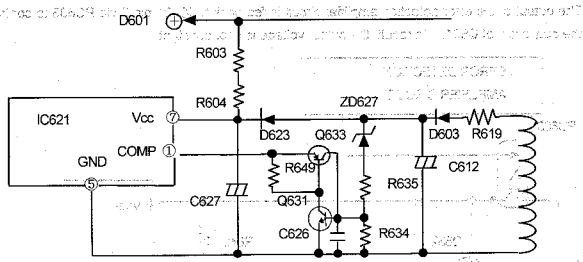
The output of the error detection amplifier circuit is fed back to IC621 pin 2 via PC603 to control the duty cycle of Q601. In result, the output voltage is kept constant.



Oscillating and Control Circuit

8) Overvoltage Protection

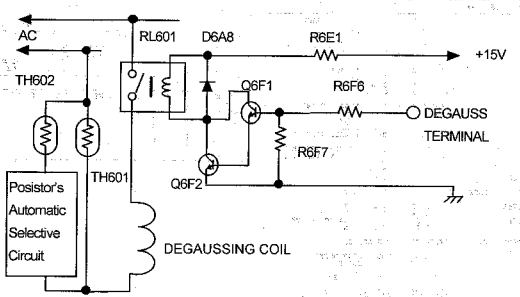
If some failure occurs and the output voltage of the secondary windings of T601 increase, the voltage of the auxiliary winding of T601 also will increase propotionarily. When the voltage of IC621 pin 7 increase beyond the zener voltage of ZD627, Q631 will turn on and Q633 turn on. This action will decrease the voltage of IC621 pin 1 and will stop the oscillator within this IC.



Overvoltage Protection

9) Degaussing Circuit

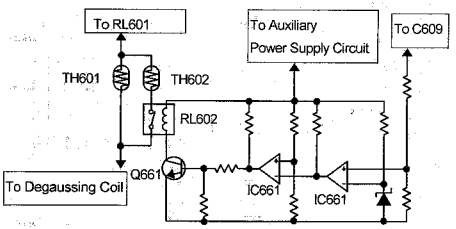
When the degauss terminal is high, RL601 is switched on and the current flows through the degaussing coil. When the degauss terminal is low, RL601 is switched off and the degaussing coil becomes open. The degauss terminal signal becomes high for only about 3 seconds when the power SW is switched on and the manual degauss switch is switched on.



Degaussing Circuit

10) Posistor's Automatic Selective Circuit

When the power switch is turn on, the voltage of C609 is detected by IC661.
If it is less than 210Vdc, IC661 output is high. This will cause Q661 and RL602 to turn on.
Then the posistor TH602 is connected in parallel with TH601.
If the voltage of C609 is more than 210Vdc, IC661 output is low. This will cause Q661 to turn off, and the posistor TH602 is not connected.



Posistor's Automatic Selective Circuit

REPLACEMENT PARTS LIST

The components specified for Model JC-1744UMA

Note: The components identified by ⚠ make are critical for safety.
Replace only with parts Number specified.

SYMBOL			PARTS NO	DESCRIPTION
*** CRT & TUNER ***				
⚠CRT			33017561	CRT M41LJC101XX22(U3)
*** ICS ***				
IC6F1			37041009	IC UPC1093J-T (REG)
IC9S2			37005085	IC UPD78L12J
IC9D1			37065193	IC PQ12RF11 (REG)
IC9C3			37065221	IC UPC78M09AHF
IC8C3			37005277	IC PQ05RR13 (REG)
IC4D1			37006022	IC LA7846N
IC5D1			37005036	IC UPC1852ACT
IC7S1			37010007	IC M52324P
IC4A1			37010053	IC CXD2077AQ
IC4Z9			37011003	IC LA5610
IC5D5			37011056	IC UPC4558C (OP AMP)
IC7D1			37041356	IC M52346SP
IC711			37011356	IC M52722SP
IC9S1			37011357	IC M52732SP
IC5L1			37051034	MOS UPD404C (COUNT)
IC9Z			37051179	IC SN74LS123N (MONO MLT)
IC8A1			37052032	IC SN74LS221N (MULTIVIB)
IC7E1			37052064	IC HD74LS08P
IC6D2			37055537	MOS MN2AC046N
IC9H2	IC6S1		37056815	IC BA10393
IC5C2	IC5K1	IC5O2	37056816	IC BA10358
IC5D4				
IC7I3	IC7S3		37056812	IC M52352P
IC7D2			37056814	IC M52035P
IC9C1	IC7E1	IC7T1	37056823	IC BA10324A (Q OP-AMP)
IC6Z1			37076081	IC UC3842N
IC5S1	IC5S2	IC7S1	37076176	MOS M52393P
IC7I2	IC9E1			
IC7I1			37076298	MOS M35043-052SP
IC7A1			37076303	IC CXA2016S
IC7Z1			37076311	IC VPS12
IC5K1			37076324	MOS HD14046BP
IC8A1			37076328	MOS LA6532-1-1P
IC4S1			37076336	MOS UPD78614FYGW-W11

SYMBOL			PARTS NO	DESCRIPTION
*** TRANSISTORS ***				
Q354			350A1590	TR 2SA1767-TA
Q353			350A2001	TR 2SA1036K-TP R
⚠Q5F1			350A2002	TR 2SA1028S-TP S
⚠Q5S7			350B9962	TR 2SB1238 P-T105
Q385			350B9972	TR 2SB1353 E-T114
Q502			350D7217	TR 2SC945-T Q
Q4E1			350E3211	TR 2SC1740S-T Q
⚠Q2D02	Q462	Q464	350E3214	TR 2SC1740S-T R
Q465	Q481	Q563		
Q5H6	Q551	Q571		
Q782			350E8905	TR 2SC1841E-T
Q7E1A			350G1017	TR 2SD2005-T105 Q
Q984			350G2572	TR 2SD2033A E-T114
Q7118	Q7116	Q711A	350H2287	TR 2SC2287A-T
Q461			350H1411	TR 2SC2001 K-T
Q782			350H4414	TR 2SC1473-TA R
Q7628	Q7626	Q762B	350J4218	TR 2SC3777-AA D
Q8C3	Q742B	Q742E	350J4818	TR 2SC1473A-TA R
Q5A2	Q742B	Q742E	350J5206	TR 2SC3455-TP
Q742B	Q853	Q855		
Q981	Q982		350J5241	TR 2SC2389S-TP R
Q852			350J5242	TR 2SC2389S-TP S
Q987			350J5262	TR 2SC4620 P-TVZ
Q101	Q102		350K3517	TR 2SA733/2SA733A-T Q
Q471	Q783	Q764	350K4112	TR 2SA949-T L
Q852			350K4311	TR 2SA963-T K
Q741B	Q741G	Q741R	350K5218	TR 2SA1018-TA R
Q983	Q5H2	Q5H4	350K5718	TR 2SA933S-T R
Q5H5	Q582			
Q555			350Z5211	TR 2SB546 K
Q781			35066311	TR 2SC2688 K
Q984			35072612	TR 2SD2388 J
⚠Q554			35095120	TR 2SC5047
Q5C1			35187680	TR 2SK1484-T
⚠Q2D01	⚠Q2D03		35100556	TR DTA114WS-T
Q6A2			35100557	TR DTA114YS-T
Q5H1	Q556	Q583	35100801	TR DTC114ES-T
Q6A3	Q801	Q802		
Q851				

SYMBOL			PARTS NO	DESCRIPTION
Q103	Q104		35100541	TR DTC114YS-T
Q556			35100554	TR DTC123JS TP
Q8A1			35125050	TR 2SK701
Q5A1			35125400	TR 2SJ196
Q591			35127470	TR 2SJ306
Q553			35127720	TR IRL1520
⚠Q591			35127900	TR 2SK2771-01R
⚠Q581			35127940	TR SLA5038
⚠Q891			35127950	TR 2SK2611
Q581			35128000	TR 2SK2822-01M
⚠Q801			35585015	TRIAC AC16FDM
*** DIODES ***				
⚠D2002	D461	D482	380K1027	DIODE 1SS132
D463	D5H1	D5H2		
D5H3	⚠D5P3	D571		
D581	D591	D5A8		
D9F1	D810	D823		
D824	D825	D829		
D827	D828	D835		
D838	D891	D962		
D883	D7N1	D7D18		
D7D1C	D7D1R	D7D2R	380K1027	DIODE 1SS132
D7D2G	D7D3R	D7D4R		
D7D4G	D7D4R	D711		
D712	D713	D714		
D777	D772	D773		
D781	D784	D821		
D85A	D851	D852		
D944				
D471	D721B	D721G	380K1032	DIODE 1SS82-TA
D72R	D722B	D722G		
D722R	D741B	D741G		
D741R	D782	D782		
D783				
D481	D8A9		350K1633	DIODE 1SS131,AT52
ZD812	ZD825		350K3098	DIODE RD12EB(3)-T4
ZD824			350K3117	DIODE RD39EB(4)-T4
ZD751			350K3170	DIODE RD6.2JS0(2)/SAB(2)
ZD801			350K3182	DIODE RD22ESB(1)-T4
ZD823			350K3602	DIODE RD2.0ESB(1)-T4
ZD5A1			350K3606	DIODE RD2.2ES B1-T4
ZD5H1			350K3625	DIODE RD4.3ESB(1)-T4
ZD5H2			350K3630	DIODE RD4.7ESB(1)-T4
ZD881			350K3631	DIODE RD4.7ESB2/ESAB(2)
ZD4A1	ZD821		350K3635	DIODE RD5.1ESB(2)-T4
ZD782			350K3636	DIODE RD5.1ESB(3)-T4
ZD931	ZD7A1	ZD7A2	350K3639	DIODE RD5.6ESB(2)-T4
ZD7A3	ZD7A4	ZD751		
ZD752	ZD8A1	ZD8A2		
ZD571			350K3642	DIODE RD8.2ES AB1-T4
ZD5B1			350K3643	DIODE RD8.2ES AB2-T4
ZD7E1B			350K3644	DIODE RD8.2ES AB3-T4
ZD551			350K3647	DIODE RD6.8ESB(2)-T4
ZD8A1			350K3652	DIODE RD7.5ESB(3)-T4
ZD5A2	ZD591		350K3658	DIODE RD9.1ESB(1)-T4
ZD721			350K3660	DIODE RD9.1ESB(3)-T4
ZD603			350K3663	DIODE RD10ESB(2)-T4
ZD4E2			350K3670	DIODE RD12ES AB1-T4
ZD883	ZD771		350K3671	DIODE RD12ES AB2-T4
⚠ZD2001			350K3690	DIODE RD20ESB(1)/ESAB(1)
ZD827			350K3697	DIODE RD22ESB

SYMBOL			PARTS NO	DESCRIPTION
ZD4E1			360X3717	DIODE RD33ES A94-T4
D802			361K7174	DIODE RU1P V1
D806	D809		361K7923	DIODE EMA15-04V1
△D2C01	D5C1	D5C2	361K7592	DIODE EGP10C 023
△D5G1				
D5A8	D603	D606	361K7570	DIODE D1NL2C
D607	D610	D629		
D551	D593		361K7837	DIODE EGP20G 023
D6F2			361K7792	DI 1S51407-T2
D552			361U7293	DIODE RK14
D6A2			361U7220	DIODE FMG-G26S
D6A4	D8A7		361W7352	DIODE RL22-LF24
D5A5			361U7926	DIODE RM1-LF-B2
D5A3			361U7729	DIODE YG801C8
△D5P1			361U7757	DIODE RU4C(LF-L1)
△D5P2			361U7756	DIODE ERD37-10E
D5A1			361U7760	DIODE FMG-G2CS
△D553			361U7783	DIODE RG302(LF-U1)
△D691			361U8201	DIODE,NETWORK 06S5A60S
△D535			361U8250	DIODE FMU-05FS
△D5P1			361U8254	DIODE RSAG3M-D4G FFT
LED101			365U1021	LED SML10A16P-LF36
LED501			365U1397	LED SEL1915CAM-LF58(C.D)
D401	D5A1	D761	365W3139	DIODE RGP10G,AT
△TH801			361T2095	POSISTOR PA3A5140B270
△TH602			361T2056	POSISTOR PA3A5B0B140
△PC603	APC602		362U0354	PHOTOCOUPLER PC123FY2
△PC601			362U0355	PHOTOCOUPLER TLP721F

*** TRANSFORMERS ***

T551	45B04022	TRANS,H.DRAIVE	
T981	45B50093	D.F.TRANS	
△L553	46Z04004	COIL,CHOKE 4MH	
L592	46Z05015	COIL,CHOKE 4MH	
△T901	46J18105	SWITCHING TRANS W480	
△T602	46701002	TRANS,PULSE	
△T881	47105708	FBT	
△T681	47T10020	TRANS,H.OUTPUT(W42E)	

SYMBOL			PARTS NO	DESCRIPTION
DEG			61317110	DEGAUSSING COIL (19.6H 10
LC902			618K6028	NOISE FILTER 1KF23X-T4
LC7A1	LC7A2	LC7A3	618K6542	NOISE FILTER FILMAC TVZ0M
LC7A4				
LC471	LC703	LC711	616K6946	NOISE FILTER TH28123MA
LC721	LC731	LC751		
LC762	LC763	LC764		
LC901				
LC702M	LC702G	LC702R	618K6954	NOISE FILTER TX07Z50NBT
LC701B	LC701G	LC701R	618K6965	NOISE FILTER TX09S00NBT
LC713				
LC741			618K6966	NOISE FILTER

*** PWB ASSYS ***

	84R49A01	SW MAIN PWB ASSY
	84R49C01	VIDEO PWB ASSY
	84R49D01	DEF PWB ASSY

*** ELECTRICAL PARTS & MISCELLANEOUS PARTS ***

HD555		317D9603	SHEET,INSULATOR
HD554	HQ551	317D9507	SHEET,INSULATOR HEAT SINK
SS901B	SS901E	SS901R	329J0214	ARRESTER(20KV),AT&Z
SS902			32990205	INSULATING CAP TIC-3.5(
			32990235	BNC/D-SUB PANEL
X801			64098039	X'TAL(IC),8.000MHZ3
△F901			66589054	FUSE U(GT) 250V 4A
SS903	AS0951		887K6007	SPARK GAP ; 5KV
CN-CRT			7D03958	CRT SOCKET(HS9340D)
△N401			70521064	AC RECEPTACLE
CORD			70819774	POWER CORD U-3 1.1 5 GRY
CABLE			73933237	SIGNAL CABLE D15P-MD15P K
△C2SP1			79544121	HV CONTROL UNIT
△C2C01			79544131	HV PROTECTOR UNIT

SYMBOL			PARTS NO	DESCRIPTION
*** VARIABLE RESISTORS ***				
VR581			410G1407	R.VARIABLE B1K
VR401			410G1415	R.VARIABLE B22K-T
△VR581			415A5163	R.VARIABLE B200K
VR6A1			415D5153	R.VARIABLE B50O
*** RELAYS & SWITCHES ***				
SW581			69181081	SWITCH,SLIDE 0022D557
△SW801			69360909	PUSH SWITCH ESG91631AXL
SW108			69360957	PUSH SWITCH ESB30
SW101	SW102	SW103	69361012	PUSH SWITCH
SW104	SW105	SW106		
SW107				
△RL581			69660045	RELAY DSBT2-M-2D-DC12V
RL851			69660046	RELAY OSA-SS-212DM5
△RL501	△RL602		69660061	RELAY OSP-1

*** COILS & FILTERS ***

LC791	LC791B	LC791G	390J0027	FILTER ZJSC-R12-100TA
LC791R				
NRC401	NRC802		39040002	RC-NETWORK 10K 1K 0.01UF
NRC803			39040003	RC,NETWORK 1K 0.01UF
NRC581			39090969	NRC-1510(J)042
△L581			60919168	COIL,H.LIN (SP)
L791			610E1711	COIL,FILTER 3.3UH
L8K2			610E1726	COIL,FILTER 27UH
L701B	L701G	L701R	610E1726	COIL,FILTER 39UH
L591	L593	L761	610F3025	COIL,FILTER 47UH
△L584			610F3041	COIL,FILTER 100UH
L6A7	L6A9	L6AQ	610F5002	FERRITE BEADS (B-02-RT)
L901				
L901B	L901C	L901R	610F8504	COIL,FILTER SPT2033A-R18K
L601			610G0111	INDUCTOR,BEADS(FB07HA121
△L5P1			610G0233	FILTER CHOKE PJBT-470K
△L5P2			610G0242	FILTER CHOKE PJBT-100M
L6A2	L6A3	L6A5	610G0257	COIL,CHOKE 33UH
L6A8				
△FL502			610G2204	LINE FILTER (HR-24-E302)
△FL503			610G2206	LINE FILTER (HR-28-ET02)
L8A1			610G9096	FILTER CHOKE 56UH K 1R5

SYMBOL			PARTS NO	DESCRIPTION
*** APPEARANCE PARTS ***				
			25426391	SPINDLE
			25427952	REVOLVING STAND ASSY
			25519511	CABINET FRONT ASSY
			25519531	CABINET BACK
			25784881	NAME PLATE,INSTRUCTION
			25784891	LABEL(CRA)(720N)(CN807A)
*** PRINTED & PACKING MATERIALS ***				
			24813191	BAG,POLYETHYLENE(150*370)
			25632881	SHEET,PROJECTION
			25835911	CARTON BOX(CN507A)
			25832941	FILLER(T),CARTON
			25832951	FILLER(B),CARTON
			78131311	P750(A) USER'S MANUAL

*** RESISTORS ***

J35	J62	J63	4DAAD10D	R.CHIP 0.0H 5% 1/2W
R904			4DAAD133	R.CHIP 22H 5% 1/2W
R425			4DAAD151	R.CHIP 120H 5% 1/2W
R7168	R7160	R716A	4DAAD161	R.CHIP 330H 5% 1/2W
R724			4DAAD163	R.CHIP 390H 5% 1/2W
R709B	R709G	R709R	4DAAD169	R.CHIP 680H 5% 1/2W
R50M			4DAAD181	R.CHIP 2.2K 5% 1/2W
R784			4DAAD221	R.CHIP 100K 5% 1/2W
J001	J002	J003	4DAA1000	R.CHIP 0H 5% 1/8W
J10	J11	J14		
J15	J16	J17		
J18	J19	J20		
J21	J22	J23		
J25	J27	J33		
J34	J5	J50		
J51	J52	J54		
J5	J51	J52		
J53	J54	J55		
J56	J57	J58		
J59	J6	J60		
J61	J64	J65		
J66	J67	J68		
J69	J7	J70		

SYMBOL			PARTS NO	DESCRIPTION
JT1	JT2	JT3	40AA1000	R-CHIP 0H 5% 1/8W
JT4	J51	J52		
J9				
R58H			40AA1165	R-CHIP 470H 5% 1/8W
R927			40AA1173	R-CHIP 1.0K 5% 1/8W
R58			40AA1209	R-CHIP 33K 5% 1/8W
R529			40AA1215	R-CHIP 56K 5% 1/8W
R430			40AA2005	R-CHIP 2.2H 5% 1/4W
R672	R674		40AA2149	R-CHIP 100H 5% 1/4W
R648			40AA2151	R-CHIP 120H 5% 1/4W
R714B	RT14G	R714R	40AA2161	R-CHIP 330H 5% 1/4W
R72A			40AA2165	R-CHIP 470H 5% 1/4W
R70E8	R70E9	R70ER	40AA2169	R-CHIP 680H 5% 1/4W
R706B	R706C	R705R		
R769	R772	R773	40AA2173	R-CHIP 1.0K 5% 1/4W
R72A			40AA2185	R-CHIP 3.3K 5% 1/4W
R744B	R744C	R744R	40AA2209	R-CHIP 33K 5% 1/4W
R743B	R743C	R743R	40AA2219	R-CHIP 82K 5% 1/4W
R742B	R742C	R742R	40AA2227	R-CHIP 180K 5% 1/4W
R741B	R741G	R741R	40AA2239	R-CHIP 220K 5% 1/4W
R746			40AA2233	R-CHIP 330K 5% 1/4W
R72EE	R703	R709	40AA3000	R-CHIP 0.0H 5% 1/10W
R706	R70K	R70L		
R70M	R703B	R703C		
R703R	R704B	R704C		
R704R	R732	R733		
R75K	R75L	R75F		
R75R	R757	R793		
R794	R795	R669		
R431			40AA3109	R-CHIP 2.2H 5% 1/10W
R669	R638		40AA3125	R-CHIP 10H 5% 1/10W
R70FB	R70FG	R70FR	40AA3133	R-CHIP 22H 5% 1/10W
R646	R642		40AA3135	R-CHIP 27H 5% 1/10W
R639	R722G	R722G	40AA3137	R-CHIP 33H 5% 1/10W
R722R				
R60H			40AA3141	R-CHIP 47H 5% 1/10W
RTK2	RTK4		40AA3143	R-CHIP 56H 5% 1/10W
R70AB	R70AG	R70AR	40AA3145	R-CHIP 68H 5% 1/10W
R6A3	R6A4		40AA3149	R-CHIP 75H 5% 1/10W
R512	R628	R635	40AA3149	R-CHIP 100H 5% 1/10W

SYMBOL			PARTS NO	DESCRIPTION
R7H5	R7H7	R7H8	40AA3185	R-CHIP 3.3K 5% 1/10W
R85H	R85K	R85L		
R85N	R85N	R85P		
R706			40AA3187	R-CHIP 3.9K 5% 1/10W
R5L6	R5OL	R5FZ	40AA3189	R-CHIP 4.7K 5% 1/10W
R5F6	R7H6	RTON		
R75N				
R795			40AA3191	R-CHIP 5.6K 5% 1/10W
R753			40AA3193	R-CHIP 6.8K 5% 1/10W
R504			40AA3195	R-CHIP 8.2K 5% 1/10W
R5K0	R5K6	R5K9	40AA3197	R-CHIP 10K 5% 1/10W
R5L3	R5L4	R5OG		
R50J	R534	R5F4		
R622	R623	R624		
R627	R629	R630		
R633	R634	R642		
R644	R649	R651		
R653	R654	R657		
R658	R7E3	R7E5		
R7F2	R7G1	R7GZ		
R7W1	R7GH	R7GTB		
R707G	R707R	R75W		
R7N2	R771	R774		
R775	R781	R782		
R783	R786	R79A		
R798	R8A5	R8A8		
R8A7	R8A9	R964		
R992				
R405	R825		40AA3201	R-CHIP 15K 5% 1/10W
R977	R7E1	R7N8	40AA3205	R-CHIP 22K 5% 1/10W
R50K	R8A2		40AA3207	R-CHIP 27K 5% 1/10W
R523	R6F8	R650	40AA3209	R-CHIP 33K 5% 1/10W
R7A5				
R826			40AA3211	R-CHIP 39K 5% 1/10W
R7N3	R7N4	R79E	40AA3213	R-CHIP 47K 5% 1/10W
R6A1	R8AF			
R632			40AA3215	R-CHIP 56K 5% 1/10W
R620			40AA3217	R-CHIP 68K 5% 1/10W
R621	R631		40AA3223	R-CHIP 120K 5% 1/10W
R6F4			40AA3229	R-CHIP 220K 5% 1/10W
R7A1	R7A2	R7A3	40AA3233	R-CHIP 330K 5% 1/10W

SYMBOL			PARTS NO	DESCRIPTION
R7A5	R7A6	R7A7	40AA3149	R-CHIP 100H 5% 1/10W
R7A8	R705B	R705G		
R705R	R725B	R725G		
R725R				
R708B	R708G	R715B	40AA3151	R-CHIP 120H 5% 1/10W
R715G	R715R	R715B		
R717G	R717R			
R515			40AA3153	R-CHIP 150H 5% 1/10W
RTF1			40AA3159	R-CHIP 270H 5% 1/10W
R6F3	RTH1	RTH2	40AA3161	R-CHIP 330H 5% 1/10W
RTH3	RTH4			
R6F1			40AA3163	R-CHIP 390H 5% 1/10W
RTE2			40AA3165	R-CHIP 470H 5% 1/10W
R5ZZ	R526	R6T1	40AA3167	R-CHIP 560H 5% 1/10W
R7B7			40AA3169	R-CHIP 680H 5% 1/10W
R42S	R5K1	R5K2	40AA3173	R-CHIP 1.0K 5% 1/10W
R5K3	R5L1	R5O1		
R502	R503	R504		
R505	R508	R508		
R509	R511	R515		
R521	R526	R531		
R532	R692	R645		
R655	RTE4	RTF1		
RTF8	RTF9	RTN1		
RTIE	RTIG	RTIH		
R71LB	R71LG	R71LR		
R731	R746B	R746G		
R749R	R75A	R75E		
R75F	R75G	R75H		
R754	R756	R757		
R758	R798	R799		
R961	R974	R981		
R52B	RTK1	RTK3	40AA3175	R-CHIP 1.2K 5% 1/10W
R71F			40AA3177	R-CHIP 1.5K 5% 1/10W
R641	R901B	R901G	40AA3179	R-CHIP 1.8K 5% 1/10W
R901R				
R637	R643	R669	40AA3181	R-CHIP 2.2K 5% 1/10W
R706	R7F5	R7G5		
R1N2	R7N5	R71K		
R797				
R585			40AA3183	R-CHIP 2.7K 5% 1/10W
R520	R653	R7H5	40AA3185	R-CHIP 3.3K 5% 1/10W

SYMBOL			PARTS NO	DESCRIPTION
R7A4			40AA3233	R-CHIP 330K 5% 1/10W
R795	R797		40AA3242	R-CHIP 750K 5% 1/10W
R535	R692		40AA3245	R-CHIP 1.0M 5% 1/10W
R50E			40AB1179	R-CHIP 1.8K 1% 1/8W
R427			40AB2138	R-CHIP 39K 1% 1/4W
R701B	R701G	R701R	40AB3245	R-CHIP 750K 1% 1/4W
R702B	R702G	R702R		
R475			40AB2187	C-CER.CHIP 3.9K 1% 1/4W
R7T2			40AB3145	R-CHIP 68K 1% 1/10W
R514			40AB3149	R-CHIP 100H 1% 1/10W
R718			40AB3155	R-CHIP 180H 1% 1/10W
R71A			40AB3161	R-CHIP 330H 1% 1/10W
R5A0			40AB3166	R-CHIP 510H 1% 1/10W
R50A			40AB3167	R-CHIP 560H 1% 1/10W
R984			40AB3171	R-CHIP 820H 1% 1/10W
R516	R517		40AB3173	R-CHIP 1.0K 1% 1/10W
R52A			40AB3177	R-CHIP 1.5K 1% 1/10W
R52E	R713		40AB3179	R-CHIP 1.8K 1% 1/10W
R516	R76A	R76F	40AB3180	R-CHIP 2.0K 1% 1/10W
R6F5	R792		40AB3182	R-CHIP 2.4K 1% 1/10W
RTG4	RTI9		40AB3183	R-CHIP 2.7K 1% 1/10W
R422			40AB3184	R-CHIP 3.0K 1% 1/10W
R512			40AB3185	R-CHIP 3.3K 1% 1/10W
R705			40AB3191	R-CHIP 5.6K 1% 1/10W
R75E			40AB3192	R-CHIP 6.2K 1% 1/10W
R540	R969		40AB3193	R-CHIP 6.8K 1% 1/10W
R51H			40AB3194	R-CHIP 7.5K 1% 1/10W
R51A	R7F5		40AB3195	R-CHIP 8.2K 1% 1/10W
R519			40AB3196	R-CHIP 9.1K 1% 1/10W
R401	R403	R5K5	40AB3197	R-CHIP 10K 1% 1/10W
R5K7	R61F			
R5K5	R55A	R651	40AB3198	R-CHIP 11K 1% 1/10W
R653				
RTF4			40AB3199	R-CHIP 12K 1% 1/10W
R421	R51K	RTF3	40AB3200	R-CHIP 13K 1% 1/10W
R424	R513		40AB3203	R-CHIP 16K 1% 1/10W
R7K5			40AB3205	R-CHIP 22K 1% 1/10W
R6L9			40AB3206	R-CHIP 24K 1% 1/10W
R423	R51E		40AB3208	R-CHIP 30K 1% 1/10W
R952	R953	R954	40AB3209	R-CHIP 33K 1% 1/10W

SYMBOL	PARTS NO.	DESCRIPTION
R958	40AB3209	R.CHIP 33K 1% 1/10W
R5K4 R670	40AB3211	R.CHIP 39K 1% 1/10W
R402 R404	40AB3212	R.CHIP 43K 1% 1/10W
R963	40AB3213	R.CHIP 47K 1% 1/10W
R471	40AB3215	R.CHIP 56K 1% 1/10W
R472	40AB3216	R.CHIP 75K 1% 1/10W
R473 R474	40AB3225	R.CHIP 150K 1% 1/10W
R961	40AD4231	R.CHIP 270K 0.5% 1/10W
R650	40AD4247	R.CHIP 1.2M 0.5% 1/10W
R411	40IC6801	R.CARBON 1.0M 5% 1/4W
ΔR5P4 ΔR5P5	40IC6833	R.CARBON 22M 5% 1/4W
R591	40IC6841	R.CARBON 47M 5% 1/4W
R650	40IC6843	R.CARBON 56M 5% 1/4W
R503	40IC6848	R.CARBON 100M 5% 1/4W
R547	40IC6857	R.CARBON 220M 5% 1/4W
R406 R905	40IC6859	R.CARBON 4.7K 5% 1/4W
R993	40IC6892	R.CARBON 6.8K 5% 1/4W
R992	40IC6895	R.CARBON 8.2K 5% 1/4W
R617	40IC6907	R.CARBON 10K 5% 1/4W
R768	40IC6909	R.CARBON 12K 5% 1/4W
R551	40IC6917	R.CARBON 180K 5% 1/4W
R612 R615	40IC6726	R.CARBON 220K 5% 1/4W
R562	40IC6731	R.CARBON 270K 5% 1/4W
R664	40IC6733	R.CARBON 330K 5% 1/4W
R660 R665	40IC6734	R.CARBON 1.0M 5% 1/4W
R556	40IC6755	R.CARBON 2.7M 5% 1/4W
ΔR985 ΔR986	40IC6814	R.CARBON 47M 5% 1/4W
R762	40IC6818	R.CARBON 4.7K 5% 1/4W
ΔR5P2	40IC6910	R.CARBON 5.6K 5% 1/4W
R902B R902R R902K	40IH5833	R.CARBON 22K 5% 1/2W
R673	40IH5847	R.CARBON 82K 5% 1/2W
R491	40IH5563	R.CARBON 390K 5% 1/2W
R409	40IH5672	R.CARBON 1.2K 5% 1/2W
ΔR995	40IH5677	R.CARBON 1.5K 5% 1/2W

SYMBOL	PARTS NO.	DESCRIPTION
R5A9 R828	40IK5713	R.CARBON 47K 5% 1/6W
R781	40IK5717	R.CARBON 68K 5% 1/6W
ΔR85C	40IK5719	R.CARBON 82K 5% 1/6W
ΔR2002 R5A2 R5H1	40IK5721	R.CARBON 100K 5% 1/6W
R802 R786 R85E		
R85F R856		
R999	40IK5733	R.CARBON 330K 5% 1/6W
ΔR5P3	40IK5736	R.CARBON 390K 5% 1/6W
R5H3	40IK5737	R.CARBON 470K 5% 1/6W
R584 R586 R584	40IK5739	R.CARBON 560K 5% 1/6W
R585 R588 R589		
R859		
R5A6	40IK5745	R.CARBON 1.0M 5% 1/6W
R618	40216282	R.WIRE 10W 1.0H
ΔR802	40299144	R.WIRE 15W 5% 1W
R991	4036Z215	R.METAL OXIDE 56K 5% 2W
R410	40371101	R.METAL 1.0M 5% 1W
ΔR5F1	40371103	R.METAL 1.2M 5% 1W
R563	40371129	R.METAL 10M 5% 1W
R561	40371131	R.METAL 15M 5% 1W
R563	40371133	R.METAL 22M 5% 1W
R575	40371137	R.METAL 3.9K 5% 1W
R476	40371211	R.METAL 39K 5% 1W
ΔR5P3	40371333	R.METAL 0.33H 5% 1W
R650	40372113	R.METAL 2.7H 5% 2W
R7E1A	40372117	R.METAL 4.7H 5% 2W
R929	40372121	R.METAL 8.8H 5% 2W
R7E1B	40372131	R.METAL 18H 5% 2W
ΔR583	40372137	R.METAL 33H 5% 2W
R610	40372143	R.METAL 86H 5% 2W
R404	40372189	R.METAL 880H 5% 2W
R643 R6A4 R6E9	40372199	R.METAL 12K 5% 2W
R605 R606	40372213	R.METAL 47K 5% 2W
R6A6 R6A9	40372221	R.METAL 100K 5% 2W
R664 R665	40373123	R.METAL 0.18M 5% 3W
R58F	40373129	R.METAL 8.2H 5% 3W
R609	40373139	R.METAL 27M 5% 3W
R603 R604	40373211	R.METAL 39K 5% 3W
R897	40373333	R.METAL 0.33H 5% 3W
ΔR5P1	40378143	R.METAL86H 5% 3W

SYMBOL	PARTS NO.	DESCRIPTION
R451	40IH5689	R.CARBON 4.7K 5% 1/2W
R559	40IH5723	R.CARBON 120K 5% 1/2W
ΔR901	40IH5737	R.CARBON 470K 5% 1/2W
R7D88	40IH5651	R.CARBON 120H 5% 1/2W
R711B R711G R711R	40IJ3820	R.CARBON 0.0H
R606		
R711B R711G R711R	40IJ3820	R.CARBON 0.0H
R60B R81C R88T		
R593	40IK5609	R.CARBON 2.2H 5% 1/6W
R999	40IK5617	R.CARBON 4.7H 5% 1/6W
R552 R8E3	40IK5628	R.CARBON 10M OL 1/6W
R5E2 R561 R58D	40IK5649	R.CARBON 100H 5% 1/6W
R821	40IK5669	R.CARBON 150H 5% 1/6W
R107	40IK5658	R.CARBON 180H 5% 1/6W
R691 R802	40IK5693	R.CARBON 390H 5% 1/6W
R468 R469 R5E3	40IK5675	R.CARBON 470H 5% 1/6W
R108 R109 R481	40IK5873	R.CARBON 1.0K 5% 1/6W
R482 R484 R878		
R577 R80A R807		
R833 R844 R847		
R848	40IK5679	R.CARBON 1.2K 5% 1/6W
R566	40IK5675	R.CARBON 1.5K 5% 1/6W
R408 R483 R483	40IK5679	R.CARBON 1.8K 5% 1/6W
R5C9 R574 R652		
R941 R516 R642	40IK5681	R.CARBON 2.2K 5% 1/6W
R803 R804	40IK5683	R.CARBON 2.7K 5% 1/6W
R547	40IK5685	R.CARBON 3.3K 5% 1/6W
R4A2 R462 R5E1	40IK5689	R.CARBON 4.7K 5% 1/6W
R5E5		
R5A7	40IK5691	R.CARBON 5.6K 5% 1/6W
R497 R5A8 R5H2	40IK5695	R.CARBON 8.2K 5% 1/6W
ΔR2003 R4E1 R4E3	40IK5697	R.CARBON 10K 5% 1/6W
R8A3 R5B2 R8H4		
R5E6 R5H6 R511		
R883 R808 R831		
R832 R841 R843		
ΔR89A R851 R853		
R85A R857		
R5A4	40IK5699	R.CARBON 12K 5% 1/6W
ΔR2005 R5E2	40IK5705	R.CARBON 22K 5% 1/6W
ΔR2004	40IK5707	R.CARBON 27K 5% 1/6W

SYMBOL	PARTS NO.	DESCRIPTION
R110 R111	4046A870	R.METAL 750H 1% 1/8W
R4A2 R5A5	4046A898	R.METAL 11K 1% 1/6W
R767	4046A726	R.METAL 196K 1% 1/6W
R110 R111	40461670	R.METAL 750H 1% 1/8W
R5A1 R992	40461671	R.METAL 820H 1% 1/8W
R407	40461681	R.METAL 2.2K 1% 1/6W
R5E7	40461684	R.METAL 3.3K 1% 1/6W
R5E4 R5E5	40461685	R.METAL 4.7K 1% 1/6W
ΔR691	40461695	R.METAL 8.2K 1% 1/6W
R4A3 R4A7 R4D6	40461697	R.METAL 10K 1% 1/6W
R5C2 R595		
R4A6 R5A5	40461698	R.METAL 11K 1% 1/6W
R4A8	40461699	R.METAL 12K 1% 1/6W
R7B8	40461701	R.METAL 15K 1% 1/6W
R550	40461702	R.METAL 16K 1% 1/6W
R5C3	40461703	R.METAL 18K 1% 1/6W
R5C6	40461705	R.METAL 22K 1% 1/6W
R5C8	40461706	R.METAL 27K 1% 1/6W
R4A8	40461708	R.METAL 30K 1% 1/6W
R5C5 R559 R561	40461715	R.METAL 56K 1% 1/6W
ΔR5D6 R685	40461717	R.METAL 68K 1% 1/6W
R561 R5E4 R763	40461719	R.METAL 82K 1% 1/6W
R444 R6C7 ΔR6B2	40461721	R.METAL 100K 1% 1/6W
ΔR6R3 R6D1 R764	40461723	R.METAL 120K 1% 1/6W
R4A5	40461724	R.METAL 130K 1% 1/6W
R767	40461726	R.METAL 160K 1% 1/6W
ΔR5H5	40461729	R.METAL 220K 1% 1/6W
R814	40461741	R.METAL 680K 1% 1/6W
R813	40461743	R.METAL 820K 1% 1/6W
R751	4046J943	R.METAL 1.3K 0.5% 1/8W
ΔR2001 ΔR592 ΔR572	4046K198	R.METAL 2.2H 5% 1/4W
ΔR4F1 R488 ΔR991	4046K215	R.METAL 10H 5% 1/4W
ΔR994		
ΔR548	40456135	R.METAL 27H 5% 1/4W
R619	40456125	R.METAL 10H 5% 1/4W
R953	40499446	R.METAL 10K 2% 1W
R642 R5H3 R6H4	4049S907	R.METAL 0.22H 5% 1/2W
ΔR594	40A8A107	R.FUSE 1.8A 5% 1/2W
ΔR581	40A8A157	R.FUSE 220H 5% 1/2W

SYMBOL			PARTS NO	DESCRIPTION
R6A8			4081J907	R.FUSE 1.0H 5% 2W
***	CAPACITORS	***		
C402	C8F2		42AA1539	C.CHIP CERAMIC 50V 1000PF
C514			42AA1511	C.CHIP CERAMIC 50V 1800PF
C406			42AA1513	C.CHIP CERAMIC 50V 2200PF
C229	C7N2		42AA1515	C.CHIP CERAMIC 50V 3300PF
C831	C7G2		42AA1517	C.CHIP CERAMIC 50V 4700PF
C5L3			42AA1520	C.CHIP CERAMIC 50V 8200PF
C623	C6Z5	C635	42AA1521	C.CHIP CERAMIC 50V 0.01UF
C639	C632		42AA1523	C.CHIP CERAMIC 50V0.015UF
C751			42AA1555	C.CERAMIC 25V 0.01UF
C791			42AA1538	C.CERAMIC 25V 0.1UF
C624	C626	C628	42AA2721	C.CERAMIC 50V 0.1UF
C632	C636	C661		
C662	C663	C773		
C421	C422	C471	42AA2726	C.CERAMIC 50V 0.01UF
C7F4	C702B	C702G		
C702R	C704B	C704G		
C704R	C712B	C712G		
C712R	C713	C857		
C975	C982			
C423	C439	C5K0	42AA2744	C.CERAMIC 25V 0.1UF
C5K2	C5K7	C5K9		
C5JA	C5GC	C5GE		
C5GF	C5G9	C5GP		
C5GG	C5G1	C5G2		
C503	C504	C505		
C508	C509	C513		
C515	C521	C523		
C524	C529	C527		
C531	C532	C751		
C7E2	C7F5	C7H1		
C7H2	C7H3	C7H5		
C7JA	C7GE	C7GK9		
C7GK6	C7GKR	C7GP8		
C7GPG	C7GPR	C7GT9		
C7GTG	C7GTR	C7GS8		
C7GB6	C7GB8	C71A		
C71EB	C71EG	C71ER		
C714B	C714G	C714R		
C715B	C715G	C715R		

SYMBOL			PARTS NO	DESCRIPTION
C817	C818		423A2015	C.CERAMIC 50V 10PF
C804	C805		423A2037	C.CERAMIC 50V 47PF
C573	C968	C961	423A2045	C.CERAMIC 50V 100PF
C956				
C462			423A2104	C.CERAMIC 50V 220PF
C969			423E2111	C.CERAMIC 500V 10PF
C561	C6F8		427F4601	C.FILM 50V 1000PF
C5K4			427F4602	C.FILM 50V 1200PF
C7Z2			427F4607	C.FILM 50V 3300PF
C6F8			427F4609	C.FILM 50V 4700PF
C6A1			427F4611	C.FILM 50V 0.022UF
C467			427F4623	C.FILM 50V 0.068UF
C6E1	C614	C7A9	427F4625	C.FILM 50V 0.1UF
C7A6	C7A7	C761	427F4629	C.FILM 50V 0.22UF
C525			427F4651	C.FILM 50V 100PF
C5K5			427F4693	C993N1H471J.ST
&C5F4			427G4456	C.FILM 630V 3900PF
&C5R2			427G6625	C.FILM 50V 0.1UF
C7A1	C7A3	C771	42683013	C.METAL FILM 50V 0.1UF
C5C7			42683027	C.METAL FILM 50V 0.47UF
C5A4			42683025	C.METAL FILM 50V 1.0UF
C5K3	C5L2		42683617	C.METAL 50V 0.22UF
C508			42683619	C.METAL 50V 0.33UF
C5CF			42BC9001	C.METAL FILM 100V 0.068UF
C5C1			42BC9352	C.METAL FILM 250V 0.1UF
&C5P2			42BE0325	C.METAL 100V 1.0UF
C472			42BE0326	C.METAL 250V 0.01UF
C465	C724B	C724G	42BC0097	C.FILM 250V 0.22UF
C724R				
C519			42BD0195	C.FILM 400V 0.022UF
C49F			42BD4317	C.METAL FILM 100V 0.22UF
C591			42BD5093	C.METAL 250V 0.1UF
&C5P3			42BE8501	C.METAL FILM 1.6KV 1000PF
&C883			42B16352	C.FILM 250V 0.12UF 5%
&C586			42B16353	C.FILM 250V 0.18UF 5%
&C584	&C585		42B16377	C.FILM 250V 0.13UF 5%
&C581			42B16379	C.FILM 250V 0.24UF 5%
&C548			42B16380	C.FILM 250V 0.30UF 5%
&C589			42B16383	C.FILM 250V 0.01UF 5%

SYMBOL			PARTS NO	DESCRIPTION
C71TB	C71TG	C71TR	42AA2744	C.CERAMIC 25V 0.1UF
C721B	C721G	C721R		
C732	C743B	C743G		
C743R	C744B	C744G		
C744R	C753	C754		
C756	C757	C758		
C759	C75A	C766		
C767	C79G	C788		
C847	C9F0	C953		
C954	C955	C971		
C972				
C716	C723G	C723R	42CA1432	C.CERAMIC 50V 47PF
C723R				
C75F			42CA1428	C.CERAMIC 50V 82PF
C75K			42CA1444	C.CERAMIC 50V 150PF
C5J3			42CA1452	C.CHIP 50V 390PF
C55C	C65F	C65G	42CA1456	C.CERAMIC 50V 470PF
C852	C855	C856		
C853			42DC9961	C.CERAMIC 500V 100PF
C9D1			42DC9557	C.CERAMIC 500V 330PF
C5A5	&C581	C742B	42DC9563	C.CERAMIC 500V 1000PF
C742G	C742R	C751		
C865	C968			
C5A2			42DC9567	C.CERAMIC 500V 2200PF
C924			42DD0019	C.CERAMIC 2KV 1000PF
&C592	&C603	&C606	42DE1087	C.CERAMIC 250V 2200PF
&C606	&C607	&C608		
C811	C818		420JJ088	C.CERAMIC 2K 220PF
C728			420J2115	C.CERAMIC 500V 0.01UF
C933			42040108	C.CERAMIC 2KV 0.01UF
C4A2	C4A3	C5H2	421A0425	C.CERAMIC 50V 0.01UF
C552	C8D8	C964		
C510			4210D211	C.CERAMIC 50V 680PF
C85C			4210D212	C.CERAMIC 50V 820PF
C5H5	C80A		4210D213	C.CERAMIC 50V 1000PF
&C2D04	C4C3	C405	4210D609	C.CERAMIC 25V 0.1UF
C5C3	C5C6	C5C8		
C5H3	C5H4	&C5P8		
C581	C6F8	C801		
C853	C852	C972		
C5A3			423A1101	C.CERAMIC 50V 470PF

SYMBOL			PARTS NO	DESCRIPTION
&C58A			42B16364	C.FILM 250V 0.82UF 5%
&C601			42B24901	C.FILM 250V 0.47UF
C55E			42B49004	C.METAL 250V 1.5UF
&C604	&C613		42B93008	C.FILM 250V 0.1UF
&C553			43B99173	C.METAL 2.0KV 4220PF
C77A			43DB9016	C.ELEC 10V 100UF
C7M4	C7GT		43DB9028	C.ELEC 16V 47UF
C78E			43DB9029	C.ELEC 16V 100UF
C781			43DB9037	C.ELEC 16V 220UF
C82Z			43DB9232	C.ELEC 16V 470UF
C761A			43DB9239	C.ELEC 25V 22UF
C7A4			43DB9240	C.ELEC 25V 47UF
C5C7	C5A8	C7F4	43DB9261	C.ELEC 50V 1.0UF
C44D	C468	C7G3	43DB9265	C.ELEC 50V 10UF
C7GGB	C7GGG	C7GGR		
C7GN9	C7GN6	C7GNR		
C986				
C4A1			43DB9267	C.ELEC 50V 33UF
&C587			43DB9268	C.ELEC 10V 100UF
C76E			43DB9269	C.ELEC 100V 22UF
C7G8			43DB9270	C.ELEC 10V 10UF
C782			43DB9553	C.ELEC 250V 2.2UF
C47B	C70F	C705	43DB8144	C.ELEC 16V 47UF
C7G5	C8A1			
C7G9			43DB8145	C.ELEC 16V 100UF
C85H	C85K	C85L	43DB8177	C.ELEC 50V 3.3UF
C857	C858	C859		
C7F7			43DB8179	C.ELEC 50V 10UF
&C2D03	&C5F1	C8E6	43DB9016	C.ELEC 10V 100UF
C59K	C76N	C79E	43DB9017	C.ELEC 10V 220UF
C5E7			43DB9020	C.ELEC 10V 1000UF
C77C			43DB9026	C.ELEC 16V 22UF
C713B	C713G	C713R	43DB9027	C.ELEC 16V 47UF
C752	C765			
C5C5	C7GL9	C7GLG	43DB9029	C.ELEC 16V 100UF
C7GLR	C71F			
C722	C756		43DB9230	C.ELEC 16V 220UF
C8E3			43DB9233	C.ELEC 16V 1000UF
C822			43DB9238	C.ELEC 25V 10UF
C425	C426	C464	43DB9241	C.ELEC 25V 47UF

SYMBOL			PARTS NO	DESCRIPTION
ΔC505	C505	C500	43089041	C.ELEC 25V 47UF
C533	C612	C952		
C956				
C75K	C851	C853	43089042	C.ELEC 25V 100UF
C952			43089043	C.ELEC 25V 220UF
C8E2	C8E9		43089045	C.ELEC 25V 470UF
C50K	C537	C703	43089051	C.ELEC 50V 1.0UF
C965				
C515	C519	C821	43089052	C.ELEC 50V 2.2UF
C711B	C711G	C711R	43089053	C.ELEC 50V 3.3UF
C956	C974		43089054	C.ELEC 50V 4.7UF
ΔC5R1	C834	C70MB	43089055	C.ELEC 50V 10UF
C70MG	C70MR	C824		
C825				
ΔC5D01			43089056	C.ELEC 50V 22UF
C983			43089058	C.ELEC 50V 47UF
C564			43089089	C.ELEC 50V 100UF
C407			43089070	C.ELEC 50V 220UF
C404	C408		43089071	C.ELEC 50V 330UF
C727	C984		43089101	C.ELEC 100V 47UF
C741B	C741G	C741R	43089512	C.ELEC 160V 1.0UF
C764			43089514	C.ELEC 160V 3.3UF
ΔC6G1			43089516	C.ELEC 160V 10UF
C74B			43089518	C.ELEC 160V 33UF
C5A1			43089564	C.ELEC 250V 3.3UF
C976			43CC0136	C.ELEC 10V 47UF
C5K8	C507	C718B	43CC0244	C.ELEC 16V 47UF
C716C	C718R			
C5K1			43CC0245	C.ELEC 16V 100UF
C628			43CC0281	C.ELEC 35V 4.7UF
C716B	C718G	C716R	43CC0276	C.ELEC 50V 2.2UF
C612			43CC0279	C.ELEC 50V 10UF
C534			43C08522	C.ELEC 25V 330UF
C594			43GJH107	C.ELEC 250V 4.7UF
C593			43GJJ231	C.ELEC 250V 10UF
C8E6			43GJJ046	C.ELEC 25V 1000UF
C8E1	C8E9		43GJJ047	C.ELEC 25V 2200UF
C5A8			43GJJ102	C.ELEC 100V 100UF
C8A7			43GJJ165	C.ELEC 100V 470UF
C8A4			43GJJ859	C.ELEC 250V 47UF

SYMBOL			PARTS NO	DESCRIPTION
C8A3			43GJJ860	C.ELEC 250V 100UF
C902			43GJK858	C.ELEC 250V 33UF
C951			43049048	C.ELEC 35V 1000UF
ΔC5P1			43069195	C.ELEC 100V 120UF
ΔC6C9			43113061	C.ELEC 400V 470UF M
C7M6	C7M8	C7M8R	433A4027	C.ELEC 16V 220UF
C7M6	C7M8	C7MRR		
C951			433A4033	C.ELEC 25V 10UF
C7A2	C7A5		433A4056	C.ELEC 50V 2.2UF
C4A8			433A8143	C.ELEC 16V 10UF
C701B	C701G	C701R	433A8147	C.ELEC 16V 47UF
C703B	C703G	C703R		
C7A4			433A8179	C.ELEC 50V 2.2UF
ΔC2D02			433A7002	C.ELEC 10V 47UF
C522			433A7013	C.ELEC 16V 47UF
C98L	ΔC98M		433A7014	C.ELEC 16V 100UF

REPLACEMENT PARTS LIST

The components specified for Model JC-1744UMB

Note: The components identified by ⚠ make are critical for safety.
Replace only with parts Number specified.

SYMBOL			PARTS NO	DESCRIPTION
*** CRT & TUNER ***				
△CRT			33017563	CRT M41LJC101X022(UF)
*** ICS ***				
IC6F1			37CA1009	IC UPC1093J-T (REG)
IC5C2			37CA1045	IC UPC78L12J
IC5B1			37CD5199	IC PQ12RF11 (REG)
IC503			37CD5221	IC LC74M09AHP
IC603			37CD5277	IC PJ05NR13 (REG)
IC4D1			37CD8022	IC LA7846N
IC9C1			37CD8038	IC UPC1892ACT
IC7B1			37CD8092	IC PS2324P
IC4A1			37CD8098	IC CXD027AQ
IC4Z0			37CD1003	IC LA6610
IC5C5			37CD1088	IC UPC4558C (OP AMP)
IC7C1			37CD1355	IC MB2938SC
IC7F1			37CD1356	IC MB2729SP
IC5B1			37CD1357	IC MB2733SP
IC8L1			37CD1534	MOS UPD4040BC (COUNT)
IC5K2			37CD1179	IC SN74LS123N (MONO MLT)
IC6A1			37CD2032	IC SN74LS221N (MULTIVIB)
IC7E1			37CD2064	IC HD74LS08P
IC8G2			37CD5537	MOS MN24C04EW
IC5H2	IC6G1		37CD6015	IC BA10393
IC8C2	IC5H1	IC5G2	37CD6016	IC BA10358
IC6D4				
IC7G3	IC7F53		37CD6812	IC MB3762P
IC7G2			37CD6814	IC MB2035P
IC5C1	IC7B1	IC7F1	37CD6026	IC BA10324A (Q OP-AMP)
IC621			37CD7601	IC UC3842N
IC5J1	IC5J2	IC7J1	37CD7178	MOS M62393P
IC7G2	IC5B1			
IC791			37CD7208	MOS M58043-052SP
IC7A1			37CD7303	IC CXA2016S
IC7Z1			37CD7311	IC VPS12
IC6C1			37CD7324	MOS HD14046BP
IC8A1			37CD732A	MOS 24LCS21-1/P
IC8D1			37CD7336	MOS UPD501 4FYC#-011

SYMBOL			PARTS NO	DESCRIPTION
Q103	Q104		38160841	TR DTC114YS-T
Q808			38160854	TR DTC123JS TP
Q8A1			36122500	TR 2SK701
Q5A1			36124500	TR 2SJ198
Q591			36127470	TR 2SJ306
Q853			36127780	TR IRLI530G
△Q5P1			36127900	TR 2SK2771-01R
MQ581			36127840	TR SLA5038
△Q6G1			36127859	TR 2SK2611
Q581			36128000	TR 2SK2522-01M
△HR601			36596015	TRIAC AC10PSM
*** DIODES ***				
△D2002	D461	D462	36DK1027	DIODE 1SS132
D463	D5H1	D5H2		
D9H3	△D5P3	D571		
D581	D591	D5A8		
D6F1	D610	D623		
D624	D625	D626		
D627	D628	D635		
D636	D651	D652		
D653	D7N1	D701B		

SYMBOL			PARTS NO	DESCRIPTION
*** TRANSISTORS ***				
Q254			36DA1500	TR 2SA1767-TA
Q853			36DA2001	TR 2SA1015-TP R
△Q6F1			36DA2002	TR 2SA1036S-TP S
△Q657			36DB9663	TR 2SB1238 P-T105
Q585			36DB9972	TR 2SB1353 E-T114
Q802			36D01217	TR 2SC945-T Q
Q461			36DE3217	TR 2SC1740S-T Q
△Q2002	Q462	Q464	36DE3218	TR 2SC1740S-T R
Q6D5	Q6E1	Q5H3		
Q5H5	Q651	Q571		
Q7E2			36DE9965	TR 2SC1841E-T
Q761A			36DG1017	TR 2SD2096-T106 Q
Q584			36DG2972	TR 2SD2033A E-T114
Q711B	Q711G	Q711R	36DH1200	TR 2SC2407A-T
Q461			36DH1811	TR 2SC2001 K-T
Q782			36DH4418	TR 2SC1473-TA R
Q702B	Q702G	Q702R	36DJ4704	TR 2SC3777-AA D
Q803			36DJ4818	TR 2SC1473A-TA R
Q5A2	Q742B	Q742G	36DJ5205	TR 2SC3415S-TP
Q742R	Q853	Q855		
Q981	Q982		36DJ5241	TR 2SC2389S-TP R
Q656			36DJ5242	TR 2SC2389S-TP S
Q987			36DJ5262	TR 2SC4620 F-TV2
Q101	Q102		36DK3517	TR 2SA733/2SA733A-T Q
Q471	Q763	Q764	36DK4112	TR 2SA916-T L
Q852			36DK4311	TR 2SA953-T K
Q741B	Q741G	Q741R	36DK5218	TR 2SA1018-TA R
Q483	Q5H2	Q5H4	36DK5718	TR 2SA9335-T R
Q5H6	Q552			
Q555			36D25211	TR 2SB546 K
Q781			36D56311	TR 2SC2688 K
Q584			36D72612	TR 2SD2396 J
△Q554			36D95120	TR 2SC5047
Q5C1			36187865	TR 2SK1484-T
△Q2001	△Q2003		36ED0156	TR DTA114WS-T
Q9A2			36ED0597	TR DTA114YS-T
Q5H1	Q556	Q583	36ED0601	TR DTC114ES-T
Q8A3	Q801	Q802		
Q951				

SYMBOL			PARTS NO	DESCRIPTION
D701G	D701R	D702B	36DK1027	DIODE 1SS132
D702E	D702R	/D703B		
D703G	D703R	D704B		
D704G	D704R	D711		
D712	D713	D714		
D771	D772	D773		
D781	D784	D821		
D85A	D851	D852		
D884				
D471	D721B	D721G	36DK1032	DIODE 1SS82-TA
D721R	D722B	D722G		
D722R	D741B	D741G		
D741R	D762	D782		
D783				
D481	D5A9		36DK1033	DIODE 1SS131,AT82
ZD622	ZD625		36DK1908	DIODE RD12ES(3)-T4
ZD624			36DK3117	DIODE RD39ES(4)-T4
ZD761			36DK3178	DIODE RD6.2(B4E2)/JSA(2)
ZD960			36DK3186	DIODE RD22ES(1)-T4
ZD623			36DK3602	DIODE RD2.0ES(B1)-T4
ZD5A1			36DK3606	DIODE RD2.2ES B1-T4
ZD5H1			36DK3626	DIODE RD4.0ES(B1)-T4
ZD5H2			36DK3630	DIODE RD4.7ES(B1)-T4
ZD597			36DK3631	DIODE RD4.7ES(B2)/ESA8(2)
ZD4A1	ZD821		36DK3635	DIODE RD5.1ES(B2)-T4
ZD762			36DK3638	DIODE RD5.1ES(B2)-T4
ZD651	ZD7A1	ZD7A2	36DK3939	DIODE RD5.6ES(B2)-T4
ZD7A3	ZD7A4	ZD751		
ZD752	ZD8A1	ZD8A2		
ZD571			36DK3942	DIODE RD6.2ES AB1-T4
ZD629			36DK3943	DIODE RD6.2ES AB2-T4
ZD761B			36DK3944	DIODE RD8.2ES AB3-T4
ZD951			36DK3947	DIODE RD6.8ES(B)-T4
ZD6A1			36DK3952	DIODE RD7.5ES(B)-T4
ZD5A2	ZD591		36DK3958	DIODE RD9.1ES(B1)-T4
ZD721			36DK3960	DIODE RD9.1ES(B3)-T4
ZD603			36DK3963	DIODE RD10ES(B2)-T4
ZD4E2			36DK3970	DIODE RD12ES AB1-T4
ZD5B2	ZD771		36DK3971	DIODE RD12ES AB2-T4
△ZD2001			36DK3990	DIODE RD20ES(B11/ESA8(1)
ZD827			36DK3997	DIODE RD22ES(B

SYMBOL NO.	PARTS NO.	DESCRIPTION
ZD4E1	360K3717	DIODE RD33ES AB4-T4
D802	361K7174	DIODE RLR-V1
D836 D839	361K7523	DIODE ERA15-04V1
A7201 D501 D502	361K7562	DIODE EQP10G G23
ΔD561		
D548 D803 D869	361K7570	DIODE D1NL20
D607 D810 D829		
D551 D593	361K7637	DIODE EGP20G G23
D6F2	361K7732	DI 1SS400-TZ
D532	36107253	DIODE RK14
D542	36107300	DIODE FMG-G2SS
D6A4 D8AT	36107350	DIODE RLZ2-LFC4
D8A5	36107526	DIODE RM1XLF-B2
D8A3	36107729	DIODE YG901C2
ΔD5F1	36107757	DIODE RM4CLF-L1)
ΔD6F2	36107756	DIODE ERD07-10E
D6A1	36107760	DIODE FMG-G2CS
ΔD533	36107763	DIODE RD3BZ(LF-U1)
ΔD601	36108201	DIODE-NETWORK DS5BA60S
ΔD535	36108250	DIODE FMG-G5FS
ΔMD5P1	36108254	DIODE ESAC39M-04D F77
LED101	36801021	LED SML1941NW-LF38
LED601	36801397	LED SEL1918CAW-LF58(C.O)
D401 D5A1 D761	360K2138	DIODE RGP10G-AT
ΔTH601	36112098	POSISTOR R30A5140B270
ΔTH602	36112098	POSISTOR R30A5B0B5140
ΔPC803	38200354	PHOTOCOUPLER PC123FY2
ΔPC601 APC602	38200355	PHOTOCOUPLER TLP721F

*** TRANSFORMERS ***

T951	45904022	TRANS.H.DRIVE
T981	45905003	D.F. TRANS
ΔLS53	46204004	COIL,CHOKE 4MH
L902	46206018	COIL,CHOKE 4MH
ΔT901	46318105	SWITCHING TRANS W450
ΔT602	48701002	TRANS,PULSE
ΔT651	47105708	FBT
ΔT661	47710020	TRANS,H.OUTPUT(M422)

SYMBOL NO.	PARTS NO.	DESCRIPTION
DEF	6137710	DEGAUSSING COIL (19.8H 16
LC902	61K6528	NOISE FILTER TMR330-TA
LC7A1 LC7A2 LC7A3	61K6942	NOISE FILTER PTLMAC TU20M
LC7A4		
LC471 LC703 LC711	616K6946	NOISE FILTER TH2812SMA
LC721 LC731 LC781		
LC762 LC783 LC764		
LC802		
LC702B LC702C LC702R	616K6964	NOISE FILTER TXQT250NBT
LC701B LC701C LC701R	616K6965	NOISE FILTER TXQ950UNBT
LC713		
LC741	616K6966	NOISE FILTER

*** PWB ASSYS ***

	84R49A01	SW MAIN PWB ASSY
	84R49C01	VIDEO PWB ASSY
	84R49D01	DEF PWB ASSY

*** ELECTRICAL PARTS & MISCELLANEOUS PARTS ***

H0555	31709503	SHEET,INSULATOR
H0554 99601	31703507	SHEET,INSULATOR-HEAT SINK
99601B 99601C 99601R	3291J0614	ARRESTER(220V),ATS2
S6902		
	32990205	INSULATING CAP TIC-3.5(
	32990235	GND/D-SUB PANEL
X801	64098938	X'TAL(16.000MHZ)
AF801	06686004	FUSE UL(ED) 250V 4A
S2903 AS6951	66706007	SPARK GAP 1.5KV
CN-CRT	76032058	CRT SOCKET(HR5046D)
AN601	70521064	AC RECEPTACLE
CORD	76800081	POWER CORD SP E 8011
CABLE	73892237	SIGNAL CABLE D15P-MD/5P K
ΔIC0SP1	79044121	HV CONTROL UNIT
ΔIC2001	79044131	HV PROTECTOR UNIT

SYMBOL NO.	PARTS NO.	DESCRIPTION
*** VARIABLE RESISTORS ***		
VR581	410G1407	R.VARIABLE B1K
VR401	410G1415	R.VARIABLE 822K-T
ΔVR591	415K5183	R.VARIABLE 3200K
VR641	415K5153	R.VARIABLE 850B

*** RELAYS & SWITCHES ***

SW581	65161081	SWITCH SLIDE 00220367
ΔSW901	65360050	PUSH SWITCH ESB61631AKL
SW108	65360052	PUSH SWITCH ESB30
SW101 SW102 SW103	65361012	PUSH SWITCH
SW104 SW105 SW106		
SW107		
ΔRL581	65660045	RELAY DSB72-M-2D-DC12V
RL851	65690046	RELAY OSA-SS-212M05
ΔRL601 ΔRL602	65690091	RELAY G5P-1

*** COILS & FILTERS ***

LC791 LC791B LC791G	390J9027	FILTER ZJSC-R12-100TA
LC791R		
MRC901 MRC902	39040002	RC,NETWORK 10K 1K 0.01UF
MRC903	39040003	RC,NETWORK 1K 0.01UF
MRC581	39040399	RESISTOR(1SI01J1042
ΔL581	80919158	COIL,H.LIN (5P)
L791	6106E171	COIL,FILTER 3.3UH
L602	6106E172	COIL,FILTER 27UH
L701B L701G L701R	6106E179	COIL,FILTER 56UH
L581 L593 L781	6106F3059	COIL,FILTER 47UH
ΔL584	6106F3041	COIL,FILTER 1000UH
L8A7 L8A8 L8A9	6106F5002	FERRITE BEADS (B-02-RT)
L8E1		
L901B L901G L901R	6106R604	COIL,FILTER SPT6203A-R18K
L901	6106D111	INDUCTOR,BEADS(FBR07HA121
ΔL5P1	6106D233	FILTER CHOKE PJ8T-470K
ΔL5P2	6106D242	FILTER CHOKE PJ8T-100M
L6A2 L6A3 L6A5	6106D257	COIL,CHOKE 33UH
L6A6		
ΔFL602	6108Z204	LINE FILTER (MR-24-E392)
ΔFL603	6108Z209	LINE FILTER (MR-28-E702)
L6A1	6106R098	FILTER CHOKE 68UH K 1R5

SYMBOL NO.	PARTS NO.	DESCRIPTION
*** APPEARANCE PARTS ***		
	2E31951!	CABINET FRONT ASSY
	2E31953!	CABINET BACK
	25426791	SPINDLE
	25427952	REVOLVING STAND ASSY
	25784901	NAME PLATE,INSTRUCTION

*** PRINTED & PACKING MATERIALS ***

	24813191	BAG,POLYETHYLENE(150X370)
	25832891	SHEET,PROTECTION
	25832971	CARTON BOX(CN0078)
	25832941	FILLER(T),CARTON
	25832951	FILLER(B),CARTON
	78131321	P750(D) USER'S MANUAL

*** RESISTORS ***

J35	J62	J63	40AA810D R.CHIP 0.0R 5% 1/2W
R904			40AAD133 R.CHIP 22K 5% 1/2W
R425			40AAD151 R.CHIP 120R 5% 1/2W
R716B	R716G	R716R	40AAD161 R.CHIP 330R 5% 1/2W
R724			40AAD163 R.CHIP 360R 5% 1/2W
R709B	R709G	R709R	40AAD189 R.CHIP 680R 5% 1/2W
R504			40AAD181 R.CHIP 2.2K 5% 1/2W
R784			40AAD221 R.CHIP 100K 5% 1/2W
J001	J002	J003	40AA1D00 R.CHIP 0R 5% 1/8W
J10	J11	J14	
J15	J16	J17	
J18	J19	J20	
J21	J22	J23	
J25	J27	J28	
J29	J3	J30	
J31	J32	J4	
J5	J51	J52	
J53	J54	J55	
J56	J57	J58	
J59	J6	J60	
J61	J64	J65	
J66	J67	J68	
J69	J7	J70	
J71	J72	J73	
J74	J81	J82	
J9			

SYMBOL			PARTS NO	DESCRIPTION
R58H			40AA1185	R.CHIP 470H 5% 1/4W
R527			40AA1173	R.CHIP 1.0K 5% 1/8W
R858			40AA1209	R.CHIP 33K 5% 1/8W
R539			40AA1315	R.CHIP 56K 5% 1/8W
R430			40AA2005	R.CHIP 2.2H 5% 1/4W
R572	R574		40AA2165	R.CHIP 100H 5% 1/4W
R848			40AA2151	R.CHIP 120H 5% 1/4W
R714B	R714C	R714R	40AA2161	R.CHIP 330H 5% 1/4W
R73A			40AA2165	R.CHIP 470H 5% 1/4W
R70EB	R70EG	R70EA	40AA2169	R.CHIP 680H 5% 1/4W
R70EB	R70EG	R70ER		
R769	R77Z	R773	40AA2173	R.CHIP 1.0K 5% 1/4W
R72ZA			40AA2185	R.CHIP 3.3K 5% 1/4W
R744B	R744G	R744R	40AA2209	R.CHIP 33K 5% 1/4W
R743B	R743G	R743R	40AA2219	R.CHIP 82K 5% 1/4W
R742B	R742G	R742R	40AA2227	R.CHIP 180K 5% 1/4W
R741B	R741G	R741R	40AA2229	R.CHIP 220K 5% 1/4W
R745			40AA2233	R.CHIP 330K 5% 1/4W
R72ZE	R73	R73A	40AA3060	R.CHIP 0.0OH 5% 1/10W
R709	R70K	R70L		
R70W	R703B	R703G		
R703R	R704B	R704G		
R704R	R792	R793		
R79K	R79L	R79P		
R79M	R79T	R793		
R794	R795	R796		
R431			40AA3109	R.CHIP 2.2H 5% 1/10W
R582	R83B		40AA3125	R.CHIP 10H 5% 1/10W
R70FB	R70FG	R70FR	40AA3139	R.CHIP 22H 5% 1/10W
R845	R847		40AA3135	R.CHIP 27H 5% 1/10W
R839	R722B	R722G	40AA3137	R.CHIP 33H 5% 1/10W
R722R				
R50H			40AA3141	R.CHIP 47H 5% 1/10W
R79Z	R7X4		40AA3143	R.CHIP 56H 5% 1/10W
R70AB	R70AG	R70AR	40AA3145	R.CHIP 68H 5% 1/10W
R8A3	R8A4		40AA3146	R.CHIP 75H 5% 1/10W
R512	R526	R535	40AA3149	R.CHIP 100H 5% 1/10W
R7A5	R7A6	R7A7		
R7A8	R705B	R705G		
R705R	R725B	R725G		

SYMBOL			PARTS NO	DESCRIPTION
R79S			40AA3187	R.CHIP 3.9K 5% 1/10W
R5L6	R50L	R6FZ	40AA3189	R.CHIP 4.7K 5% 1/10W
R9FG	R7N8	R70N		
R7BN				
R785			40AA3191	R.CHIP 5.6K 5% 1/10W
R753			40AA3193	R.CHIP 6.8K 5% 1/10W
R804			40AA3195	R.CHIP 8.2K 5% 1/10W
R5KC	R5K8	R5K9	40AA3197	R.CHIP 10K 5% 1/10W
R5L3	R5L4	R5O0		
R5DJ	R534	R5F8		
R622	R623	R524		
R627	R629	R530		
R633	R634	R642		
R644	R649	R661		
R663	R664	R667		
R668	R7C3	R7C5		
R7F2	R7G1	R7G2		
R7N7	R7QH	R7QT8		
R7QT6	R707R	R75M		
R75Z	R771	R774		
R775	R781	R78Z		
R783	R786	R79A		
R798	R8A5	R8A9		
R8A7	R8A9	R964		
R982				
R4D5	R525		40AA3201	R.CHIP 15K 5% 1/10W
R677	R7E1	R7N8	40AA3205	R.CHIP 22K 5% 1/10W
R50K	R8A2		40AA3207	R.CHIP 27K 5% 1/10W
R523	R6F9	R650	40AA3209	R.CHIP 33K 5% 1/10W
R7A9				
R5Z8			40AA3211	R.CHIP 39K 5% 1/10W
R7N3	R7N4	R79E	40AA3213	R.CHIP 47K 5% 1/10W
R8A1	R8A8			
R632			40AA3215	R.CHIP 55K 5% 1/10W
R620			40AA3217	R.CHIP 68K 5% 1/10W
R521	R631		40AA3223	R.CHIP 120K 5% 1/10W
R6F4			40AA3229	R.CHIP 220K 5% 1/10W
R7A1	R7A2	R7A3	40AA3233	R.CHIP 330K 5% 1/10W
R7A4				
R736	R787		40AA3242	R.CHIP 750K 5% 1/10W
R636	R652		40AA3245	R.CHIP 1.0M 5% 1/10W

SYMBOL			PARTS NO	DESCRIPTION
R725R			40AA3149	R.CHIP 100H 5% 1/10W
R70EB	R70ER	R715B	40AA3151	R.CHIP 120H 5% 1/10W
R715G	R715R	R717B		
R717G	R717R			
R518			40AA3153	R.CHIP 150H 5% 1/10W
R7F1			40AA3159	R.CHIP 270H 5% 1/10W
R6F3	R7H1	R7H2	40AA3161	R.CHIP 330H 5% 1/10W
R7H3	R7H4			
R6F1			40AA3163	R.CHIP 390H 5% 1/10W
R7E2			40AA3165	R.CHIP 470H 5% 1/10W
R522	R526	R671	40AA3167	R.CHIP 560H 5% 1/10W
R767			40AA3169	R.CHIP 680H 5% 1/10W
R4Z6	R5K1	R5K2		R.CHIP 1.0K 5% 1/10W
R5K3	R5L1	R5O1		
R502	R503	R504		
R505	R506	R508		
R509	R511	R515		
R521	R528	R531		
R532	R662	R645		
R668	R7B4	R7F7		
R7F8	R7F9	R7N1		
R71E	R715	R71N		
R71LB	R71LC	R71LR		
R731	R745B	R745G		
R745R	R75A	R75E		
R75F	R75G	R75H		
R754	R755	R757		
R758	R759	R769		
R98H	R974	R981		
R525	R7K1	R7K3	40AA3175	R.CHIP 1.2K 5% 1/10W
R715			40AA3177	R.CHIP 1.5K 5% 1/10W
R641	R901B	R901G	40AA3179	R.CHIP 1.8K 5% 1/10W
R901R				
R937	R643	R669	40AA3181	R.CHIP 2.2K 5% 1/10W
R7E6	R7F6	R7G6		
R7N2	R7N5	R71K		
R787				
R585			40AA3183	R.CHIP 2.7K 5% 1/10W
R523	R603	R7H5	40AA3185	R.CHIP 3.3K 5% 1/10W
R7H6	R7H7	R7H8		
R83A	R85C	R89L		
R85M	R85N	R95P		

SYMBOL			PARTS NO	DESCRIPTION
R50E			40AB1179	R.CHIP 1.8K 1% 1/8W
R427			40AB2139	R.CHIP 39H 1% 1/4W
R701B	R701G	R701R	40AB2149	R.CHIP 75H 1% 1/4W
R702B	R702G	R702R		
R47S			40AB2187	C.CER.CHIP 3.9K 1% 1/4W
R712			40AB3145	R.CHIP 68H 1% 1/10W
R514			40AB3149	R.CHIP 100H 1% 1/10W
R718			40AB3165	R.CHIP 180H 1% 1/10W
R71A			40AB3181	R.CHIP 330H 1% 1/10W
R510			40AB3186	R.CHIP 510H 1% 1/10W
R50A			40AB3187	R.CHIP 560H 1% 1/10W
R944			40AB3171	R.CHIP 820H 1% 1/10W
R516	R517		40AB3175	R.CHIP 1.2K 1% 1/10W
R52A			40AB3177	R.CHIP 1.5K 1% 1/10W
R526	R713		40AB3179	R.CHIP 1.8K 1% 1/10W
R519	R76A	R76F	40AB3180	R.CHIP 2.0K 1% 1/10W
R6F5	R792		40AB3182	R.CHIP 2.4K 1% 1/10W
R754	R719		40AB3183	R.CHIP 2.7K 1% 1/10W
R422			40AB3184	R.CHIP 3.0K 1% 1/10W
R5L2			40AB3189	R.CHIP 4.7K 1% 1/10W
R765			40AB3191	R.CHIP 5.6K 1% 1/10W
R76E			40AB3192	R.CHIP 6.2K 1% 1/10W
R640	R969		40AB3193	R.CHIP 6.8K 1% 1/10W
R51H			40AB3194	R.CHIP 7.5K 1% 1/10W
R91A	R7F5		40AB3195	R.CHIP 8.2K 1% 1/10W
R7F4			40AB3196	R.CHIP 9.1K 1% 1/10W
R401	R4D3	R5K8	40AB3197	R.CHIP 10K 1% 1/10W
R6K1	R61F			
R505	R55A	R951	40AB3198	R.CHIP 11K 1% 1/10W
R983				
R7F3			40AB3199	R.CHIP 12K 1% 1/10W
R421	R51K	R7F3	40AB3200	R.CHIP 13K 1% 1/10W
R424	R513		40AB3203	R.CHIP 18K 1% 1/10W
R7N2			40AB3205	R.CHIP 22K 1% 1/10W
R5L8			40AB3206	R.CHIP 24K 1% 1/10W
R423	R51E		40AB3208	R.CHIP 30K 1% 1/10W
R952	R953	R954	40AB3209	R.CHIP 33K 1% 1/10W
R555				
R5K4	R6T0		40AB3211	R.CHIP 39K 1% 1/10W
R402	R404		40AB3212	R.CHIP 43K 1% 1/10W

SYMBOL	PARTS NO	DESCRIPTION
R952	40AB3213	R,CHIP 47K 1% 1/10W
R471	40AB3215	R,CHIP 56K 1% 1/10W
R472	40AB3218	R,CHIP 75K 1% 1/10W
R473 R474	40AB3225	R,CHIP 150K 1% 1/10W
R601	40AD4291	R,CHIP 270K 0.5% 1/10W
R602	40AD4247	R,CHIP 1.2M 0.5% 1/10W
R411	40AE0601	R,CARBON 1.0M 5% 1/4W
ΔR5P4 ΔR5P5	40JC0633	R,CARBON 22H 5% 1/4W
R691	40JC0641	R,CARBON 47H 5% 1/4W
R850	40JC0643	R,CARBON 56H 5% 1/4W
R603	40JC0649	R,CARBON 100H 5% 1/4W
R5A7	40JC0657	R,CARBON 270H 5% 1/4W
R498 R905	40JC0689	R,CARBON 4.7K 5% 1/4W
R993	40JC0693	R,CARBON 6.8K 5% 1/4W
R592	40JC0695	R,CARBON 8.2K 5% 1/4W
R617	40JC0697	R,CARBON 10K 5% 1/4W
R765	40JC0699	R,CARBON 12K 5% 1/4W
R5B1	40JC0727	R,CARBON 180K 5% 1/4W
R812 R615	40JC0729	R,CARBON 220K 5% 1/4W
R582	40JC0731	R,CARBON 270K 5% 1/4W
R584	40JC0733	R,CARBON 330K 5% 1/4W
R580 R595	40JC0745	R,CARBON 1.0M 5% 1/4W
R859	40JC0755	R,CARBON 2.7M 5% 1/4W
ΔR665 ΔR986	40JC0141	R,CARBON 47H 5% 1/4W
R782	40JC0189	R,CARBON 4.7K 5% 1/4W
ΔR5F2	40JC0191	R,CARBON 5.6K 5% 1/4W
R902B R902R R902R	40JH0639	R,CARBON 22H 5% 1/2W
R673	40JH0647	R,CARBON 82H 5% 1/2W
R4A1	40JH0663	R,CARBON 390H 5% 1/2W
R402	40JH0675	R,CARBON 1.0K 5% 1/2W
ΔR998	40JH0677	R,CARBON 1.5K 5% 1/2W
R481	40JH0689	R,CARBON 4.7K 5% 1/2W
R859	40JH0723	R,CARBON 120K 5% 1/2W
ΔR601	40JH0737	R,CARBON 470K 5% 1/2W

SYMBOL	PARTS NO	DESCRIPTION
ΔR602 R5A2 R6H1	40JK5721	R,CARBON 100K 5% 1/6W
R903 R796		
R9EF R895		
R590	40JK5733	R,CARBON 330K 5% 1/6W
ΔR5A3	40JK5735	R,CARBON 390K 5% 1/6W
R543	40JK5737	R,CARBON 470K 5% 1/6W
R58A R58C R584	40JK5739	R,CARBON 560K 5% 1/6W
R586 R588 R589		
R5A8		
R5A6	40JK5745	R,CARBON 1.0M 5% 1/6W
R618	40210202	R,WIRE 10H 1 OH
ΔR902	40299146	R,WIRE 15H 5W 7W
R991	40JF2215	R,METAL OXIDE 56K 5% 2W
R410	40371101	R,METAL 1.00 5% 1W
ΔR5F1	40371103	R,METAL 1.2H 5% 1W
R583	40371125	R,METAL 10H 5% 1W
R5E1	40371131	R,METAL 18H 5% 1W
R553	40371133	R,METAL 22H 5% 1W
R575	40371187	R,METAL 3.9K 5% 1W
R476	40371211	R,METAL 39K 5% 1W
ΔR503	40371333	R,METAL 0.33H 5% 1W
R850	40371727	R,METAL 2.7H 5% 2W
R7E1A	40372117	R,METAL 8.2H 5% 2W
R823	40372121	R,METAL 6.8H 5% 2W
R7E18	40372131	R,METAL 18H 5% 2W
ΔR583	40372137	R,METAL 33H 5% 2W
R810	40372143	R,METAL 56H 5% 2W
R464	40372169	R,METAL 680H 5% 2W
R6A3 R6A4 R6E9	40372199	R,METAL 12K 5% 2W
R605 R606	40372213	R,METAL 47K 5% 2W
R6A8 R6A9	40372221	R,METAL 100K 5% 2W
R554 R555	40372241	R,METAL 0.68H 5% 2W
R58C	40373123	R,METAL 8.2H 5% 3W
R609	40373163	R,METAL 27OH 5% 3W
R803 R604	40373211	R,METAL 39K 5% 3W
R527	40373333	R,METAL 0.33H 5% 3W
ΔR5P1	40376143	R,METAL 56H 5% 3W
R110 R111	4O4CA670	R,METAL 750H 1% 1/6W
R446 R9A5	4O4CA698	R,METAL 11K 1% 1/6W
R767	4O4CA725	R,METAL 160K 1% 1/6W

SYMBOL	PARTS NO	DESCRIPTION
R7089	40JH8851	R,CARBON 120H 5% 1/2W
R7118 R711G R711R	40JJ3820	R,CARBON 0.0H
R808		
R7118 R711G R711R	40JJ3820	R,CARBON 0.0H
R806 R810 R987		
R593	40JK5609	R,CARBON 2.2H 5% 1/6W
R989	40JK5617	R,CARBON 4.7H 5% 1/6W
R852 R6F3	40JK5625	R,CARBON 10H 5% 1/6W
R5E2 R551 R58D	40JK5649	R,CARBON 100H 5% 1/6W
R621	40JK5653	R,CARBON 150H 5% 1/6W
R107	40JK5665	R,CARBON 330H 5% 1/6W
R501 R802	40JK5683	R,CARBON 680H 5% 1/6W
R468 R469 R5E3	40JK5695	R,CARBON 470K 5% 1/6W
R105 R109 R491	40JK5873	R,CARBON 1.0K 5% 1/6W
R482 R48A R576		
R577 R80A R827		
R633 R844 R847		
R640	40JK5675	R,CARBON 1.2K 5% 1/6W
R558	40JK5677	R,CARBON 1.5K 5% 1/6W
R404 R453 R483	40JK5679	R,CARBON 1.8K 5% 1/6W
R5C9 R574 R852		
R5H1 R516	40JK5681	R,CARBON 2.2K 5% 1/6W
R833 R854	40JK5683	R,CARBON 2.7K 5% 1/6W
R5H7	40JK5685	R,CARBON 3.3K 5% 1/6W
R442 R492 R5E1	40JK5689	R,CARBON 4.7K 5% 1/6W
R658		
R5A7	40JK5691	R,CARBON 5.6K 5% 1/6W
R487 R548 R5H2	40JK5695	R,CARBON 8.2K 5% 1/6W
ΔR2003 R4E1 R4E3	40JK5697	R,CARBON 10K 5% 1/6W
R5A3 R592 R5H4		
R545 R5H6 R811		
R683 R808 R831		
R632 R841 R846		
ΔR65A R851 R853		
R654 R857		
R644	40JK5699	R,CARBON 12K 5% 1/6W
ΔR2005 R6E2	40JK5705	R,CARBON 22K 5% 1/6W
ΔR2004	40JK5707	R,CARBON 27K 5% 1/6W
R548 R828	40JK5713	R,CARBON 47K 5% 1/6W
R751	40JK5717	R,CARBON 68K 5% 1/6W
ΔR65C	40JK5719	R,CARBON 82K 5% 1/6W

SYMBOL	PARTS NO	DESCRIPTION
R110 R111	4O4C1870	R,METAL 750H 1% 1/8W
R5A1 R992	4O4C1871	R,METAL 82OH 1% 1/8W
R407	4O4C1872	R,METAL 2.2K 1% 1/8W
R627	4O4C1884	R,METAL 3.6K 1% 1/8W
R6E5 R6E6	4O4C1891	R,METAL 5.6K 1% 1/8W
ΔR581	4O4C1892	R,METAL 6.8K 1% 1/8W
R4A3 R4A7 R406	4O4C1897	R,METAL 10K 1% 1/8W
R4C2 R6A5		
R448 R5A5	4O4C1898	R,METAL 11K 1% 1/8W
R5C4	4O4C1899	R,METAL 12K 1% 1/8W
R768	4O4C1701	R,METAL 15K 1% 1/8W
R580	4O4C1702	R,METAL 16K 1% 1/8W
R5C3	4O4C1703	R,METAL 18K 1% 1/8W
R5C7	4O4C1705	R,METAL 22K 1% 1/8W
R5C8	4O4C1707	R,METAL 27K 1% 1/8W
R4A8	4O4C1708	R,METAL 30K 1% 1/8W
R5C5 R559 R681	4O4C1713	R,METAL 56K 1% 1/8W
ΔR508 R598	4O4C1717	R,METAL 68K 1% 1/8W
R581 R6E4 R7B3	4O4C1718	R,METAL 82K 1% 1/8W
R4A4 R5C7 ΔR5R2	4O4C1721	R,METAL 100K 1% 1/8W
ΔR583		
R5C1 R764	4O4C1723	R,METAL 120K 1% 1/8W
R4A5	4O4C1724	R,METAL 130K 1% 1/8W
R767	4O4C1726	R,METAL 160K 1% 1/8W
ΔR595	4O4C1728	R,METAL 220K 1% 1/8W
R814	4O4C1741	R,METAL 680K 1% 1/8W
R813	4O4C1743	R,METAL 820K 1% 1/8W
R151	4O4J9443	R,METAL 1.3K 0.5% 1/8W
ΔR2001 ΔR562 ΔR572	4O4K5109	R,METAL 2.2H 5% 1/4W
ΔR4F1 R465 ΔR6GT	4O4K5126	R,METAL 10H 5% 1/4W
ΔR994		
ΔR6H8	4O4K5135	R,METAL 27H 5% 1/4W
R919	4O4O5125	R,METAL 10H 5% 1/4W
R983	4O4S9449	R,METAL 10K 2% 1W
R8H2 R6H3 R6H4	4O4S9507	R,METAL 0.22H 5% 1/2W
ΔR594	4O8A8107	R,FUSE 1.8H 5% 1/2W
ΔR581	4O8A8157	R,FUSE 220H 5% 1/2W
R6A8	4O81J907	R,FUSE 1.0H 5% 2W

SYMBOL			PARTS NO	DESCRIPTION
		*** CAPACITORS ***		
C402	C6FZ		42AA1509	C.CHIP CERAMIC 50V 100PF
C514			42AA1511	C.CHIP CERAMIC 50V 150PF
C409			42AA1513	C.CHIP CERAMIC 50V 220PF
C629	C7N2		42AA1515	C.CHIP CERAMIC 50V 330PF
C631	C782		42AA1517	C.CHIP CERAMIC 50V 470PF
C513			42AA1520	C.CHIP CERAMIC 50V 680PF
C623	C625	C635	42AA1521	C.CHIP CERAMIC 50V 0.01UF
C630	C632		42AA1523	C.CHIP CERAMIC 50VD.0156F
C758			42AA1527	C.CERAMIC 25V 0.01UF
C701			42AA1538	C.CERAMIC 25V 0.1UF
C624	C626	C629	42AA2721	C.CERAMIC 50V 0.1UF
C627	C635	C661		
C662	C663	C773	42AA2728	C.CERAMIC 50V 0.01UF
C471	C422	C471		
C774	C762B	C7D2C		
C702B	C704B	C704C		
C704R	C712B	C712G		
C712R	C71F	C8C7		
C975	C982		42AA2744	C.CERAMIC 25V 0.1UF
C423	C430	C5K0		
C5K2	C5KT	C5K9		
C60A	C60C	C60E		
C60F	C60G	C60P		
C600	C601	C602		
C603	C604	C605		
C606	C609	C613		
C516	C521	C523		
C524	C526	C527		
C531	C532	C7E1		
C7E2	C7F5	C7H1		
C7H2	C7H3	C7H5		
C70A	C70E	C70KB		
C70KG	C70KR	C70PB		
C70PE	C70PR	C70T5		
C707G	C707R	C708B		
C708G	C708R	C71A		
C71EB	C71EG	C71ER		
C714B	C714G	C714R		
C715B	C715G	C715R		
C717B	C717G	C717R		
C721B	C721G	C721R		

SYMBOL			PARTS NO	DESCRIPTION
C573	C958	C981	423A2045	C.CERAMIC 50V 100PF
C565				
C462			423A2194	C.CERAMIC 50V 220PF
C548			423E2111	C.CERAMIC 500V 470PF
C5H1	C5F8		42TF4501	C.FILM 50V 1000PF
C5K4			42TF4602	C.FILM 50V 1200PF
C5FE			42TF4607	C.FILM 50V 3300PF
C5F5			42TF4609	C.FILM 50V 4700PF
C6A1			42TF4617	C.FILM 50V 0.022UF
C46F			42TF4623	C.FILM 50V 0.068UF
C6F1	C614	C7A9	42TF4625	C.FILM 50V 0.1UF
C7A6	C7A7	C7F1	42TF4629	C.FILM 50V 0.22UF
C950			42TF4651	C.FILM 50V 100PF
C5K5			42TF4693	C0G3NH471J-BT
AC5P4			42T03458	C.FILM 630V 390PF
AC5R2			42T80825	C.FILM 50V 0.1UF
C7A1	C7A3	C7J1	42B83013	C.METAL FILM 50V 0.1UF
C5C1			42B83021	C.METAL FILM 50V 0.47UF
C5A4			42B83029	C.METAL FILM 50V 1.0UF
C5K3	C5L2		42B83617	C.METAL 50V 0.22UF
C506			42B83618	C.METAL 50V 0.33UF
C5C2			42E90001	C.METAL FILM 100V 0.068UF
C481			42E90022	C.METAL FILM 250V 0.1UF
AC5P2			42E90025	C.METAL 100V 1.0UF
C472			42E90081	C.METAL 250V 0.01UF
C465	C724B	C724C	42E00097	C.FILM 250V 0.22UF
C724R				
C570			42E00165	C.FILM 400V 0.022UF
C408			42E04317	C.METAL FILM 100V 0.22UF
C561			42E06165	C.METAL 250V 0.1UF
AC5P3			42E08501	C.METAL FILM 1.6KV 1000PF
AC583			42E16352	C.FILM 250V 0.12UF 5%
AC586			42E16353	C.FILM 250V 0.15UF 5%
AC584	AC585		42E16377	C.FILM 250V 0.13UF 5%
AC581			42E16379	C.FILM 250V 0.24UF 5%
AC585			42E16380	C.FILM 250V 0.30UF 5%
AC589			42E16383	C.FILM 250V 0.51UF 5%
AC58A			42E16384	C.FILM 250V 0.62UF 5%
AC601			42E24881	C.FILM 250V 0.47UF
C595			42E98004	C.METAL 250V 1.5UF

SYMBOL			PARTS NO	DESCRIPTION
C732	C743B	C743G	42AA2744	C.CERAMIC 25V 0.1UF
C743R	C744B	C744G		
C744R	C753	C754		
C756	C757	C758		
C759	C784	C786		
C787	C79C	C7B8		
C8A2	C95G	C953		
C954	C965	C971		
C973				
C715	C723B	C723G	42CA1432	C.CERAMIC 50V 47PF
C79F			42CA1438	C.CERAMIC 50V 82PF
C79K			42CA1444	C.CERAMIC 50V 180PF
C907			42CA1452	C.CERAMIC 50V 330PF
C85E	C85F	C85G	42CA1460	C.CERAMIC 50V 470PF
C854	C955	C959		
C902			42CD0551	C.CERAMIC 500V 100PF
C901			42CD9557	C.CERAMIC 500V 330PF
C5A5	AC581	C742B	42CD9563	C.CERAMIC 500V 1000PF
C742G	C742R	C791		
C985	C988			
C8A2			42CD9567	C.CERAMIC 500V 2200PF
C904			42CD0219	C.CERAMIC 2KV 1000PF
AC602	ACD03	AC605	42DECD87	C.CERAMIC 250V 2200PF
AC606	AC607	AC608		
C611	C618		42DJJ088	C.CERAMIC 2K 22PF
C729			42DJ0118	C.CERAMIC 500V 0.01UF
C903			42EA0106	C.CERAMIC 2KV 0.01UF
C4A2	C4A3	C5H2	42EA0425	C.CERAMIC 50V 0.01UF
C552	C8C8	C954		
C510			42ECD211	C.CERAMIC 50V 560PF
C85C			42ECD212	C.CERAMIC 50V 820PF
C505	C606		42ECD213	C.CERAMIC 50V 1000PF
AC2004	C4D3	C4D5	42ED8009	C.CERAMIC 25V 0.1UF
C5D3	C5D8	C5D9		
C5K3	C5H4	AC5P3		
C581	C8F4	C801		
C803	C852	C972		
C8A3			423A1101	C.CERAMIC 50V 470PF
C417	C818		423A2015	C.CERAMIC 50V 10PF
C804	C805		423A2037	C.CERAMIC 50V 47PF

SYMBOL			PARTS NO	DESCRIPTION
AC604	AC613		42B89098	C.FILM 250V 0.1UF
AC593			42B90173	C.METAL 2.0KV 4200P
C7F6			43GB6016	C.ELEC 10V 100UF
C7N4	C7GT		43GB6029	C.ELEC 16V 47UF
C76F			43GB6029	C.ELEC 16V 100UF
C7A1			43GB6030	C.ELEC 16V 220UF
C602			43GB6032	C.ELEC 16V 470UF
C761A			43GB6039	C.ELEC 25V 22UF
C45A			43GB6041	C.ELEC 25V 47UF
C5C7	C7A8	C7F8	43GB6051	C.ELEC 50V 1.0UF
C4A5	C4B8	C7N3	43GB6065	C.ELEC 50V 10UF
C709B	C709G	C709R		
C709P	C70NG	C70NR		
C959				
C4A1			43GB6067	C.ELEC 50V 33UF
AC597			43GB6098	C.ELEC 10V 47UF
C75E			43GB6096	C.ELEC 10V 22UF
C762			43GB6101	C.ELEC 16V 10UF
C782			43GB6553	C.ELEC 250V 2.2UF
C47C	C70F	C70S	43GB6144	C.ELEC 16V 47UF
C70M	C8A1			
C709			43GB6145	C.ELEC 16V 100UF
C85W	C85K	C85L	43GB6147	C.ELEC 16V 3.3UF
C857	C858	C859		
C777			43GB6179	C.ELEC 50V 10UF
AC2003	AC5F1	D6E8	43GB9016	C.ELEC 10V 100UF
C58K	C76H	C79E	43GB9017	C.ELEC 10V 220UF
C6E7			43GB9320	C.ELEC 16V 1000UF
C772			43GB9926	C.ELEC 16V 22UF
C713B	C713G	C713R	43GB9928	C.ELEC 16V 33UF
C752	C765			
C5C5	C7DLB	C7GLG	43GB9929	C.ELEC 16V 100UF
C7DLR	C7IF			
C722	C766		43GB9930	C.ELEC 16V 220UF
C6E3			43GB9933	C.ELEC 16V 1000UF
C922			43GB9938	C.ELEC 25V 100UF
C425	C426	C464	43GB9941	C.ELEC 25V 47UF
AC5P5	C5D8	C5DD		
C833	C812	C85Z		
C955				

SYMBOL			PARTS NO.	DESCRIPTION
C76K	C851	C853	430B9042	C,ELEC 25V 100UF
C827			430B9043	C,ELEC 25V 220UF
C82Z	C8E5		430B9045	C,ELEC 25V 470UF
C50K	C837	C793	430B9091	C,ELEC 50V 1.0UF
C853				
C919	C519	C821	430B9082	C,ELEC 50V 2.2UF
C711B	C711E	C711R	430B9083	C,ELEC 50V 3.3UF
C856	C874		430B9084	C,ELEC 50V 4.7UF
ΔC5R1	C834	C70MB	430B9085	C,ELEC 50V 10UF
C70MS	C7DMR	C824		
C825				
ΔC2B51			430B9088	C,ELEC 50V 22UF
C985			430B9088	C,ELEC 50V 47UF
C884			430B9089	C,ELEC 50V 100UF
C40T			430B9070	C,ELEC 50V 220UF
C4D4	C40S		430B5071	C,ELEC 50V 330UF
C731	C864		430B9101	C,ELEC 100V 47UF
C741B	C741C	C741R	430B9512	C,ELEC 160V 1.0UF
C764			430B9514	C,ELEC 160V 3.3UF
ΔC591			430B9516	C,ELEC 160V 10UF
C745			430B9518	C,ELEC 160V 33UF
C5A1			430B9554	C,ELEC 250V 3.3UF
C97G			430C0135	C,ELEC 10V 47UF
C6K6	C5GT	C718B	430C0244	C,ELEC 16V 47UF
C718G	C718R			
C5K1			430C0245	C,ELEC 16V 100UF
C526			430C0251	C,ELEC 35V 4.7UF
C718B	C716G	C718R	430C0278	C,ELEC 50V 2.2UF
C512			430C0279	C,ELEC 50V 10UF
C534			430C0522	C,ELEC 25V 330UF
C594			430JH107	C,ELEC 250V 4.7UF
C593			430JJ231	C,ELEC 250V 10UF
C6E6			430JJ048	C,ELEC 25V 1000UF
C6E1	C6E9		430JJ047	C,ELEC 25V 2200UF
C5A5			430JJ102	C,ELEC 100V 100UF
C6A7			430JJ105	C,ELEC 100V 470UF
C6A4			430JJ568	C,ELEC 250V 47UF
C6A3			430JJ569	C,ELEC 250V 100UF
C992			430Z9568	C,ELEC 250V 33UF
C997			430A9048	C,ELEC 35V 1000UF

SYMBOL			PARTS NO.	DESCRIPTION
ΔC5P1			430B9195	C,ELEC 100V 120UF
ΔC609			431130B1	C,ELEC 400V 470UF M
C7H6B	C7H6G	C7H6R	433A4027	C,ELEC 16V 220UF
C70RB	C70RG	C70RR		
C6A1			433A4033	C,ELEC 25V 10UF
C7A2	C7A5		433A4056	C,ELEC 50V 2.2UF
C4A6			433A6143	C,ELEC 16V 10UF
C701B	C701G	C701R	433A6142	C,ELEC 16V 47UF
C703B	C703G	C703R		
C7A4			433A8179	C,ELEC 50V 2.2UF
ΔC2D02			433A7002	C,ELEC 10V 47UF
C622			433A7013	C,ELEC 16V 47UF
C58L	ΔC58M		433A7014	C,ELEC 16V 100UF

REPLACEMENT PARTS LIST

The components specified for Model JC-1744UMR

Note: The components identified by⚠make are critical for safety.
Replace only with parts Number specified.

SYMBOL			PARTS NO	DESCRIPTION
*** CRT & TUNER ***				
△CRT			33017564	CRT M41LJC101XX22(U3)(R)
*** IC ***				
IC5F1			370A1009	IC UPC1093J-T (REG)
IC952			37009085	IC UPC78L18J
IC951			37005193	IC PQ12RS11 (REG)
IC5G8			37005221	IC UPC78M09AHF
IC803			37005277	IC PQ05RS11 (REG)
IC4C1			37006022	IC LA7840N
IC501			37009035	IC UPC1892ACT
IC751			37010007	IC M52324P
IC4A1			37010008	IC CXA2067AD
IC420			37011003	IC LA6510
IC505			37011068	IC UPC4558C (OP AMP)
IC701			37011356	IC M52345SP
IC711			37011358	IC M52722SP
IC951			37011357	IC M52723SP
IC5L1			37051034	MOS UPD404080 (COUNT)
IC5K2			37051179	IC SN74LS123N (MONO MLT)
IC5A1			37052032	IC SN74LS221N (MULTIVIB)
IC7E1			37052084	IC HD74LS08P
IC802			37055837	MOS MM24C04EN
IC5H2	IC561		37056815	IC BA10393
IC502	IC5H1	IC502	37056816	IC BA10358
IC524				
IC703	IC753		37056812	IC M52352P
IC702			37056814	IC M52039P
IC5C1	IC761	IC771	37059926	IC BA10324A (Q OP-AMP)
IC621			37076081	IC UC3842N
IC531	IC532	IC731	37076176	MOS M52193P
IC752	IC961			
IC781			37076298	MOS M35043-052SP
IC7A1			37076303	IC CXA2018S
IC721			37076311	IC VPS12
IC5K1			37076324	MOS M51404BP
IC8A1			37076328	MOS 24LC32I-/P
IC801			37076338	MOS UPD78014FYGW-W11

SYMBOL			PARTS NO	DESCRIPTION
Q103	Q104		351G0841	TR DTC114YS-T
Q956			351G0854	TR DTC123JS TP
Q8A1			3512290D	TR 2SK701
Q5A1			3512490D	TR 2SJ198
Q591			3512747G	TR 2SJ305
Q533			3512772G	TR IRLI530G
△Q8F1			3512790G	TR 2SK2771-01R
MQ591			3512794D	TR SLA5038
△Q501			3512795D	TR 2SK2611
Q581			3512800G	TR 2SK2552-01M
△Q8G1			3585801S	TRIAC ACTOPGM
*** DIODES ***				
△D2902	D4E1	D462	360K1027	DIODE 1SS132
D453	D9N1	D5H2		
D5A3	△D5F3	DQ71		
D581	D591	D5A8		
D5F1	D610	D523		
D824	D825	D826		
D827	D926	D535		
D536	D861	D952		
D953	D7N1	D7G18		

SYMBOL			PARTS NO	DESCRIPTION
*** TRANSISTORS ***				
Q954			350A1590	TR 2SA1767-TA
Q983			350A2091	TR 2SA1038S-TP R
△Q5F1			350A2092	TR 2SA1038S-TP S
△Q857			350B9962	TR 2SB1328 P-T105
Q985			350B9972	TR 2SB1353 E-T114
Q602			35007217	TR 2SC945-T Q
Q4E1			350E3217	TR 2SC1740S-T Q
△Q2D02	Q462	Q464	350E3218	TR 2SC1740S-T R
Q465	Q481	Q5H3		
Q9M5	Q551	Q571		
Q752			350E8905	TR 2SC1841E-T
Q7E1A			350G1017	TR 2SD2005-T105 Q
Q954			350G2672	TR 2SD2033A E-T114
Q7116	Q7116	Q711R	350H3200	TR 2SD874A-T
Q461			350H1811	TR 2SC2901 K-T
Q782			350H4418	TR 2SC1623-TA R
Q702B	Q702G	Q702R	350J4704	TR 2SC3777-AA D
Q603			350J4818	TR 2SC1473A-TA R
Q5A2	Q742B	Q742G	350J5206	TR 2SC3418S-YP
Q742R	Q853	Q855		
Q981	Q982		350J5241	TR 2SC2389S-TP R
Q858			350J5242	TR 2SC2389S-TP S
Q987			350J5262	TR 2SC4620 P-TV2
Q101	Q102		350K3517	TR 2SA733/2SA733A-T Q
Q471	Q763	Q764	350K4112	TR 2SA916-T L
Q852			350K4418	TR 2SA1015-T K
Q741B	Q741G	Q741R	350K5218	TR 2SA1018-TA R
Q483	Q5A2	Q5H4	350K5718	TR 2SA933S-T R
Q586	Q552			
Q955			350Q5211	TR 2SB545 K
Q761			350S6311	TR 2SC2688 K
Q984			350Y2612	TR 2SD2396 J
△Q5E4			3506E129	TR 2SC5047
Q5C1			35187690	TR 2SK1484-T
△Q2D01	△Q2D03		35190756	TR DTA114WS-T
Q8AZ			35190953	TR DTA114YS-T
Q5H1	Q559	Q583	35190961	TR DTC114ES-T
Q843	Q801	Q802		
Q851				

SYMBOL			PARTS NO	DESCRIPTION
D701G	D701R	D702B	360K1027	DIODE 1SS132
D702G	D702R	D703B		
D703G	D703R	D704B		
D704G	D704R	D711		
D712	D713	D714		
D771	D772	D773		
D781	D784	D821		
D85A	D851	D852		
D854				
D471	D721B	D721G	360K1032	DIODE 1SS82-TA
D721R	D722B	D722G		
D722R	D741B	D741G		
D741R	D762	D782		
D783				
D461	D649		360K1033	DIODE 1SS131,ATB2
ZD602	ZD625		360K3098	DIODE RD12EB(3)-T4
ZD624			360K3117	DIODE RD39EB(4)-T4
ZD781			360K3170	DIODE RD8.2JSB(2)/ESAB(2)
ZD501			360K3186	DIODE RD22EB(1)-T4
ZD523			360K3502	DIODE RD2.0ESB(1)-T4
ZD5A1			360K3505	DIODE RD2.2ES B1-T4
ZD5A1			360K3626	DIODE RD4.3ESB(1)-T4
ZD5A2			360K3639	DIODE RD4.7ESB(1)-T4
ZD981			360K3631	DIODE RD4.7ESB(2)/ESAB(2)
ZD4A1	ZD821		360K3635	DIODE RD5.1ESB(2)-T4
ZD782			360K3638	DIODE RD5.1ESB(3)-T4
ZD661	ZD7A1	ZD7A2	360K3639	DIODE RD5.6ESB(2)-T4
ZD7A3	ZD7A4	ZD751		
ZD752	ZD8A1	ZD8A2		
ZD871			360K3642	DIODE RD6.2ES AB1-T4
ZD879			360K3643	DIODE RD6.2ES AB2-T4
ZD761B			360K3644	DIODE RD6.2ES AB3-T4
ZD5A1			360K3647	DIODE RD6.8ESB(2)-T4
ZD6A1			360K3652	DIODE RD7.5ESB(2)-T4
ZD6A2	ZD921		360K3658	DIODE RD9.1ESB(1)-T4
ZD721			360K3660	DIODE RD8.1ESB(3)-T4
ZD603			360K3663	DIODE RD10ESB(2)-T4
ZD4E2			360K3670	DIODE RD12ES AB1-T4
ZD6E2	ZD771		360K3671	DIODE RD12ES AB2-T4
△ZD2001			360K3690	DIODE RD20ESB(1)/ESAB(1)
ZD627			360K3697	DIODE RD22ESB

SYMBOL	PARTS NO	DESCRIPTION
ZD4E1	360K3717	DIODE RD33ES AB4-T4
D808	361K7174	DIODE N11P V1
D808 D809	361K7523	DIODE ERA15-04V1
△D9001 D9C1 D9C2	361K7582	DIODE EGP10G GZ3
△D961		
D9A2 D9D3 D9D6	361K7570	DIODE D1NL20
D9D7 D9T0 D9Z9		
D951 D993	361K7637	DIODE EGP20G GZ3
D9F2	361K7732	DI 1S31407-T2
D962	361G7793	DIODE RK14
D9A2	361G7320	DIODE FMG-62ES
D944 D9A7	361G7352	DIODE RL22-LFC4
D6A5	361G7526	DIODE-RMI-LF-B2
D6A3	361G7729	DIODE YG801C2
△D9F1	361G7757	DIODE RU4C(LF-E1)
△D9F2	361G7758	DIODE ERG37-10E
D6A1	361G7760	DIODE FMG-62CS
△D953	361G7763	DIODE RC3B2C(LF-U1)
△D991	361G8201	DIODE-NETWORK DS6BA60S
△D955	361G8350	DIODE FMG-65FS
△MD9P1	361G8254	DIODE ESAC39M-04D F77
LED101	361G8367	LED SML19416M-LF3B
LED801	365G1357	LED SEL1915CAM-LF5B(C,D)
D401 D5A1 D781	369K2136	DIODE RGP10G,AT
△TH601	381J2065	POSISTOR PA3A9140B27G
△TH602	381J2067	POSISTOR PA3A5R0S814G
△PC803	382G0354	PHOTOCOUPLER PC123FY2
△PC801 △PC802	382G0356	PHOTOCOUPLER TLP721F

*** TRANSFORMERS ***

T951	458G4022	TRANS,H.DRAIVE
T981	458G5012	D.F.TRANS
△L953	462G4004	COIL,CHOKE 4MH
L992	462G5016	COIL,CHOKE 4MH
△T901	463J8105	SWITCHING TRANS W490
△T602	467D1002	TRANS,PULSE
△T551	471G5702	FBT
△T561	477I0020	TRANS,H.OUTPUT(W422)

SYMBOL	PARTS NO	DESCRIPTION
DEG	613I7110	DEGAUSSING COIL (19.6H 10
LC992	616K6928	NOISE FILTER 1H223X-TA
LC7A1 LC7A2 LC7A3 LC7A4	616K6942	NOISE FILTER PILMAC T020M
LC471 LC703 LC711 LC721 LC731 LC761	616K6946	NOISE FILTER TH226123MA
LC762 LC783 LC784 LC901		
LC7D2B LC7D2S LC702R	616K6964	NOISE FILTER TX07250NBT
LC701B LC701G LC701R	616K6965	NOISE FILTER TX09500NBT
LC713		
LC741	616K6966	NOISE FILTER

*** PWB ASSYS ***

	84R49A01	SW MAIN PWB ASSY
	84R49C01	VIDEO PWB ASSY
	84R49D01	DEF PWB ASSY

*** ELECTRICAL PARTS & MISCELLANEOUS PARTS ***

HD555	31709503	SHEET,INSULATOR
HG564 HG801	31709507	SHEET,INSULATOR HEAT SINK
SG901B SG901E SG901R	32J40214	ARRESTER(260V),ATBZ
SG902	32990205	INSUIATING CAP TIC-3.5(
	32990235	BNC/D-SUB PANEL
X601	64D98035	X'TAL(10.000MHZ)
△F601	66659064	FUSE UL(ST) 250V 4A
SG903 AS0951	66T69007	SPARK GAP : 5KV
CN-CRT	70D32008	CRT SOCKET(H90440)
△MJ061	70S21064	AC RECEPTACLE
CABLE	73H93237	SIGNAL CABLE D15P-MD15P K
CORD	75613033	POWER CORD
△LCD5P1	79644121	HV CONTROL UNIT
△LC201	79644131	HV PROTECTOR UNIT

*** VARIABLE RESISTORS ***

VR581	41D51407	R,VARIABLE B1K
VR401	41D91415	R,VARIABLE B22K-T
△VR581	415K5163	R,VARIABLE B200K
VR6A1	415D5153	R,VARIABLE B50D

*** RELAYS & SWITCHES ***

SW581		85181081	SWITCH SLIDE 03220867
△SW601		85360099	PUSH SWITCH ESS9161AXL
SW108		85360697	PUSH SWITCH ESS30
SW101	SW102 SW103	85361672	PUSH SWITCH
SW104	SW105 SW106		
SW107			
△RL581		85660045	RELAY OSB72-M-2D-DC12V
RL851		85660046	RELAY OSA-SS-212DM5
△RL601 △RL602		85660001	RELAY OSP-1

*** COILS & FILTERS ***

LC791	LC791B LC791G	390J9027	FILTER ZJSC-R12-100TA
LC791R			
MRC601	MRC802	39040002	RC,NETWORK 10K 1K 0.01UF
MRC803		39040003	RC,NETWORK 1K 0.01UF
MRC581		39040750	ARC,1S101J1D4Z
△L581		80B76188	COIL,H.LIN (5R)
L761		810E1741	COIL,FILTER 3.3UH
L602		810E1742	COIL,FILTER 27UH
L701B	L701G L701R	810E1728	COIL,FILTER 56UH
L591	L593 L791	810F2025	COIL,FILTER 47UH
△L584		810F3041	COIL,FILTER 100UH
L6A7	L6A8 L6A9	810F5002	FERRITE BEADS (B-02-RT)
L6E1			
L9D1B	L9D1G L9D1R	810F8504	COIL,FILTER SPT0203A-R18K
L801		810M0111	INDUCTOR,BEADS(FBR07HA121
△LSP1		810G0233	FILTER CHOKE PJBT-470K
△LSP2		810H0242	FILTER CHOKE PJBT-100M
L6A2	L6A3 L6A5	810G0287	COIL,CHOKE 33UH
L6A6			
△FL602		810G2204	LINE FILTER (HR-24-E302)
△FL603		810G2209	LINE FILTER (HR-28-E702)
L6A1		810H0886	FILTER CHOKE 68UH K 1R5

SYMBOL	PARTS NO	DESCRIPTION
*** APPEARANCE PARTS ***		
	2E319511	CABINET FRONT ASSY
	2E319641	CABINET BACK
	2542639J	SPINDLE
	25427652	REVOLVING STAND ASSY
	25784921	NAME PLATE,INSTRUCTION

*** PRINTED & PACKING MATERIALS ***

	24813181	BAG,POLYETHYLENE(180*370)
	25432861	SHEET,PROTECTION
	25632931	CARTON BOX(C9507R)
	25832951	FILLER(T),CARTON
	25832951	FILLER(S),CARTON
	78131321	P750(B) USER'S MANUAL

*** RESISTORS ***

J35	J62 J63	40AA0100	R,CHIP 0 OH 5% 1/2W
R984		40AA0133	R,CHIP 22K 5% 1/2W
R425		40AA0151	R,CHIP 120H 5% 1/2W
R716B	R715G R716R	40AA0181	R,CHIP 330H 5% 1/2W
R724		40AA0183	R,CHIP 390H 5% 1/2W
R709B	R709G R709R	40AA0169	R,CHIP 680H 5% 1/2W
R59K		40AA0181	R,CHIP 2.2K 5% 1/2W
R784		40AA0221	R,CHIP 100K 5% 1/2W
J007	J002 J003	40AA1000	R,CHIP 0H 5% 1/8W
J10	J11 J14		
J15	J16 J17		
J18	J19 J20		
J21	J22 J23		
J25	J27 J28		
J29	J3 J30		
J31	J32 J4		
J5	J51 J62		
J63	J64 J65		
J66	J67 J68		
J69	J7 J70		
J71	J72 J73		
J74	J81 J82		
J9			

SYMBOL			PARTS NO	DESCRIPTION
R58H			40AA1165	R.CHIP 470H 5% 1/8W
R527			40AA1173	R.CHIP 1.0K 5% 1/8W
R528			40AA1209	R.CHIP 33K 5% 1/8W
R529			40AA1215	R.CHIP 68K 5% 1/8W
R439			40AA2005	R.CHIP 2.2H 5% 1/4W
R672	R674		40AA2149	R.CHIP 100H 5% 1/4W
R648			40AA2151	R.CHIP 120H 5% 1/4W
R714B	R714G	R714R	40AA2181	R.CHIP 330H 5% 1/4W
R53A			40AA2185	R.CHIP 470H 5% 1/4W
R706B	R706G	R706R	40AA2189	R.CHIP 680H 5% 1/4W
R706D	R706G	R706R		
R769	R772	R773	40AA2173	R.CHIP 1.0K 5% 1/4W
R762A			40AA2185	R.CHIP 3.3K 5% 1/4W
R744B	R744G	R744R	40AA2209	R.CHIP 33K 5% 1/4W
R743B	R743G	R743R	40AA2219	R.CHIP 82K 5% 1/4W
R742B	R742G	R742R	40AA2227	R.CHIP 180K 5% 1/4W
R741B	R741G	R741R	40AA2229	R.CHIP 220K 5% 1/4W
R746			40AA2233	R.CHIP 330K 5% 1/4W
R762E	R763	R768	40AA3000	R.CHIP 0.0H 5% 1/10W
R703	R70K	R70L		
R70M	R703G	R703G		
R703R	R704B	R704G		
R704R	R732	R733		
R75K	R75L	R76P		
R758	R757	R753		
R794	R795	R966		
R431			40AA3109	R.CHIP 2.2H 5% 1/10W
R59G	R538		40AA3125	R.CHIP 18H 5% 1/10W
R70FB	R70FG	R70FR	40AA3133	R.CHIP 22H 5% 1/10W
R648	R647		40AA3135	R.CHIP 27H 5% 1/10W
R639	R722B	R722G	40AA3137	R.CHIP 33H 5% 1/10W
R722R				
R50H			40AA3141	R.CHIP 47H 5% 1/10W
R7K2	R7K4		40AA3143	R.CHIP 56H 5% 1/10W
R70AB	R70AG	R70AR	40AA3145	R.CHIP 68H 5% 1/10W
R8A3	R8AA		40AA3146	R.CHIP 75H 5% 1/10W
R512	R52E	R535	40AA3149	R.CHIP 100H 5% 1/10W
R7A5	R7A6	R7A7		
R7A8	R705B	R705G		
R705R	R725B	R725G		

SYMBOL			PARTS NO	DESCRIPTION
R798			40AA3187	R.CHIP 3.9K 5% 1/10W
R5L8	R50L	R6F2	40AA3189	R.CHIP 4.7K 5% 1/10W
R6F8	R7N6	R70W		
R75N				
R785			40AA3191	R.CHIP 5.6K 5% 1/10W
R753			40AA3193	R.CHIP 6.8K 5% 1/10W
R6G4			40AA3195	R.CHIP 8.2K 5% 1/10W
R5K0	R5K8	R5K9	40AA3197	R.CHIP 10K 5% 1/10W
R5L3	R5L4	R5G6		
R5GU	R534	R6F9		
R622	R623	R654		
R627	R629	R630		
R633	R634	R642		
R644	R648	R661		
R663	R694	R69T		
R698	R7E3	R7E5		
R7F2	R791	R762		
R7NT	R7QH	R707G		
R707G	R707R	R75M		
R752	R771	R774		
R775	R781	R782		
R783	R784	R78A		
R798	R8A5	R8A6		
R8A7	R8A8	R8B4		
R982				
R405	R625		40AA3201	R.CHIP 15K 5% 1/10W
R6F7	R7E1	R7N8	40AA3205	R.CHIP 22K 5% 1/10W
R50K	R8A2		40AA3207	R.CHIP 27K 5% 1/10W
R623	R6F9	R65G	40AA3209	R.CHIP 33K 5% 1/10W
R7A9				
R626			40AA3211	R.CHIP 39K 5% 1/10W
R7N3	R7N4	R75E	40AA3213	R.CHIP 47K 5% 1/10W
R6A1	R8A8			
R632			40AA3215	R.CHIP 56K 5% 1/10W
R620			40AA3217	R.CHIP 68K 5% 1/10W
R621	R631		40AA3219	R.CHIP 82K 5% 1/10W
R6F4			40AA3221	R.CHIP 120K 5% 1/10W
R7A1	R7A2	R7A3	40AA3223	R.CHIP 150K 5% 1/10W
R7A4				R.CHIP 330K 5% 1/10W
R786	R787		40AA3242	R.CHIP 750K 5% 1/10W
R636	R652		40AA3245	R.CHIP 1.0M 5% 1/10W

SYMBOL			PARTS NO	DESCRIPTION
R725R			40AA3149	R.CHIP 100H 5% 1/10W
R708B	R708R	R715G	40AA3151	R.CHIP 120H 5% 1/10W
R715G	R715R	R717B		
R717G	R717R			
R518			40AA3153	R.CHIP 150H 5% 1/10W
R7F1			40AA3159	R.CHIP 270H 5% 1/10W
R6F3	R7H1	R7H2	40AA3161	R.CHIP 330H 5% 1/10W
R7N3	R7N4			
R9F1			40AA3163	R.CHIP 390H 5% 1/10W
R7E2			40AA3165	R.CHIP 470H 5% 1/10W
R522	R525	R671	40AA3167	R.CHIP 560H 5% 1/10W
R727			40AA3169	R.CHIP 680H 5% 1/10W
R426	R5X1	R5K2	40AA3173	R.CHIP 1.0K 5% 1/10W
R5K3	R5L1	R501		
R502	R503	R504		
R505	R508	R509		
R508	R511	R515		
R521	R528	R531		
R532	R662	R645		
R666	R754	R7F7		
R7F9	R7F8	R7N1		
R715	R71G	R71H		
R71LB	R71LG	R71LR		
R731	R745B	R745G		
R746R	R755	R75E		
R75F	R706	R75H		
R754	R756	R757		
R758	R759	R769		
R961	R974	R983		
R625	R7K1	R7K3	40AA3175	R.CHIP 1.2K 5% 1/10W
R71C			40AA3177	R.CHIP 1.5K 5% 1/10W
R641	R901B	R901G	40AA3179	R.CHIP 1.8K 5% 1/10W
R901R				
R637	R643	R659	40AA3181	R.CHIP 2.2K 5% 1/10W
R76B	R7F6	R798		
R7N2	R7N5	R71K		
R797				
R665			40AA3183	R.CHIP 2.7K 5% 1/10W
R520	R663	R7N5	40AA3185	R.CHIP 3.3K 5% 1/10W
R7N6	R7N7	R7N8		
R85H	R85K	R85L		
R85N	R85N	R85P		

SYMBOL			PARTS NO	DESCRIPTION
R50E			40AB1178	R.CHIP 1.8K 1% 1/8W
R497			40AB2139	R.CHIP 39H 1% 1/4W
R701B	R701G	R701R	40AB2149	R.CHIP 75H 1% 1/4W
R702B	R702G	R702R		
R475			40AB2167	C.CER.CHIP 3.9K 1% 1/4W
R712			40AB3145	R.CHIP 86H 1% 1/10W
R514			40AB3149	R.CHIP 100H 1% 1/10W
R716			40AB3155	R.CHIP 160H 1% 1/10W
R71A			40AB3161	R.CHIP 330H 1% 1/10W
R510			40AB3166	R.CHIP 510H 1% 1/10W
R50A			40AB3167	R.CHIP 560H 1% 1/10W
R994			40AB3171	R.CHIP 820H 1% 1/10W
R510	R51T		40AB3175	R.CHIP 1.2K 1% 1/10W
R52A			40AB3177	R.CHIP 1.5K 1% 1/10W
R52E	R713		40AB3179	R.CHIP 1.8K 1% 1/10W
R516	R764	R76F	40AB3180	R.CHIP 2.0K 1% 1/10W
R6F5	R792		40AB3182	R.CHIP 2.4K 1% 1/10W
R724	R719		40AB3183	R.CHIP 2.7K 1% 1/10W
R422			40AB3184	R.CHIP 3.0K 1% 1/10W
R6L2			40AB3186	R.CHIP 4.7K 1% 1/10W
R705			40AB3191	R.CHIP 5.6K 1% 1/10W
R75E			40AB3192	R.CHIP 6.2K 1% 1/10W
R640	R968		40AB3193	R.CHIP 6.8K 1% 1/10W
R51H			40AB3194	R.CHIP 7.5K 1% 1/10W
R51A	R75		40AB3195	R.CHIP 8.2K 1% 1/10W
R519			40AB3196	R.CHIP 9.1K 1% 1/10W
R401	R403	R5K8	40AB3197	R.CHIP 10K 1% 1/10W
R5K7	R51F			
R5K5	R95A	R951	40AB3198	R.CHIP 11K 1% 1/10W
R953				
R7P4			40AB3199	R.CHIP 12K 1% 1/10W
R421	R51K	R7F3	40AB3200	R.CHIP 13K 1% 1/10W
R424	R513		40AB3201	R.CHIP 15K 1% 1/10W
R7K5			40AB3205	R.CHIP 22K 1% 1/10W
R5L9			40AB3206	R.CHIP 24K 1% 1/10W
R423	R51E		40AB3208	R.CHIP 30K 1% 1/10W
R952	R953	R954	40AB3209	R.CHIP 33K 1% 1/10W
R955				
R5K6	R67G		40AB3211	R.CHIP 39K 1% 1/10W
R402	R404		40AB3212	R.CHIP 43K 1% 1/10W

SYMBOL	PARTS NO.	DESCRIPTION
R982	40AB3213	R.CHIP 47K 1% 1/10W
R471	40AB3215	R.CHIP 56K 1% 1/10W
R472	40AB3218	R.CHIP 75K 1% 1/10W
R473 R474	40AB3226	R.CHIP 150K 1% 1/10W
R967	40AB4231	R.CHIP 270K 0.5% 1/10W
R800	40AB4247	R.CHIP 1.2M 0.5% 1/10W
RA11	40CD6001	R.CARBON 1.0H 5% 1/4W
⚠R5P4 ⚠R5P5	40IC6633	R.CARBON 22H 5% 1/4W
R991	40IC6841	R.CARBON 47H 5% 1/4W
R1550	40IC6643	R.CARBON 56H 5% 1/4W
R903	40IC6648	R.CARBON 130H 5% 1/4W
R967	40IC6657	R.CARBON 220H 5% 1/4W
R486 R935	40IC6655	R.CARBON 4.7K 5% 1/4W
R993	40IC6693	R.CARBON 5.6K 5% 1/4W
R982	40IC6695	R.CARBON 8.2K 5% 1/4W
R617	40IC6697	R.CARBON 10K 5% 1/4W
R765	40IC6699	R.CARBON 12K 5% 1/4W
R581	40IC6727	R.CARBON 180K 5% 1/4W
R612 R615	40IC6729	R.CARBON 220K 5% 1/4W
R582	40IC6731	R.CARBON 270K 5% 1/4W
R584	40IC6735	R.CARBON 330K 5% 1/4W
R560 R585	40IC6745	R.CARBON 1.0M 5% 1/4W
R856	40IC6755	R.CARBON 2.7M 5% 1/4W
⚠R986 ⚠R988	40IC6811	R.CARBON 47M 5% 1/4W
R782	40IC6189	R.CARBON 4.7K 5% 1/4W
⚠R967	40IC6193	R.CARBON 9.09K 5% 1/4W
R902B R902A R902B	40IK6633	R.CARBON 22H 5% 1/2W
R573	40IK5647	R.CARBON 82H 5% 1/2W
RA41	40IK5823	R.CARBON 390H 5% 1/2W
R409	40IK5975	R.CARBON 1.2K 5% 1/2W
⚠R993	40IK6673	R.CARBON 1.5K 5% 1/2W
R481	40IK5889	R.CARBON 4.7K 5% 1/2W
R829	40IK5723	R.CARBON 120K 5% 1/2W
⚠R601	40IK5737	R.CARBON 470K 5% 1/2W

SYMBOL	PARTS NO.	DESCRIPTION
⚠R902 R5A2 R6H1 R808 R769 R856 R855	40IX5721	R.CARBON 100K 5% 1/8W
R990	40IK5733	R.CARBON 330K 5% 1/8W
⚠R5P3	40IK5735	R.CARBON 390K 5% 1/8W
R5H3	40IK5737	R.CARBON 470K 5% 1/8W
R584 R584C R584D R586 R588 R589	40IK5739	R.CARBON 560K 5% 1/8W
R546	40IK5745	R.CARBON 1.0M 5% 1/8W
R618	40216282	R.WIRE 10H 1.0H
⚠R692	40290144	R.WIRE 15H 5% 1W
R991	493F2215	R.METAL OXIDE 220K 5% 2W
R410	40371101	R.METAL 1.0H 5% 1W
⚠R5F1	40371103	R.METAL 1.2H 5% 1W
R563	40371129	R.METAL 10H 5% 1W
R611	40371131	R.METAL 18H 5% 1W
R583	40371133	R.METAL 22H 5% 1W
R575	40371187	R.METAL 3.9K 5% 1W
R478	40371211	R.METAL 39K 5% 1W
⚠R993	40371333	R.METAL 0.39H 5% 1W
RA60	40372111	R.METAL 2.7H 5% 2W
R761A	40372117	R.METAL 4.7H 5% 2W
R629	40372121	R.METAL 6.8H 5% 2W
R761B	40372131	R.METAL 15H 5% 2W
⚠R583	40372133	R.METAL 18H 5% 2W
R610	40372143	R.METAL 68H 5% 2W
R484	40372147	R.METAL 180H 5% 2W
R643 R6A4 R6E9	40372199	R.METAL 12K 5% 2W
R605 R6D5	40372213	R.METAL 47K 5% 2W
R606 R6A9	40372251	R.METAL 100K 5% 2W
R554 R555	40372341	R.METAL 0.68H 5% 2W
R5E5	40373122	R.METAL 8.2H 5% 3W
R699	40373159	R.METAL 270H 5% 3W
R603 R604	40373211	R.METAL 39K 5% 3W
R607	40373333	R.METAL 0.33H 5% 2W
⚠R5P1	40378143	R.METAL 68H 5% 3W
R110 R111	4064A870	R.METAL 750H 1% 1/6W
R4A6 R5A5	4064A698	R.METAL 11K 1% 1/8W
R767	4064A726	R.METAL 160K 1% 1/8W

SYMBOL	PARTS NO.	DESCRIPTION
R7086	401K6951	R.CARBON 120H 5% 1/2W
R711A R711B R711R	401J9820	R.CARBON 0.0H
R806		
R711A R711B R711R	401J9820	R.CARBON 0.0H
R806 R810 R987		
R593	401K5609	R.CARBON 2.2H 5% 1/6W
R983	401K5617	R.CARBON 4.7H 5% 1/6W
R552 R553	401K5625	R.CARBON 10H 5% 1/6W
R562 R551 R5A0	401K5647	R.CARBON 82H 5% 1/6W
R621	401K5663	R.CARBON 150H 5% 1/6W
R107	401K5655	R.CARBON 180H 5% 1/6W
R801 R802	401K5663	R.CARBON 330H 5% 1/6W
R488 R499 R5E9	401K5665	R.CARBON 470H 5% 1/6W
R108 R109 R481	401K5673	R.CARBON 1.0K 5% 1/6W
R487 R484 R575		
R577 R40A R807		
R833 R844 R847		
R848	401K5675	R.CARBON 1.2K 5% 1/6W
R556	401K5677	R.CARBON 1.5K 5% 1/6W
R498 R483 R483	401K5679	R.CARBON 1.8K 5% 1/6W
R5C8 R574 R852		
R5H1 R616	401K5681	R.CARBON 2.2K 5% 1/6W
R803 R804	401K5683	R.CARBON 2.7K 5% 1/6W
R5H7	401K5685	R.CARBON 3.3K 5% 1/6W
R4A2 R482 R5E1	401K5689	R.CARBON 4.7K 5% 1/6W
R5E8		
R547	401K5691	R.CARBON 5.6K 5% 1/6W
R467 R5A8 R5H2	401K5695	R.CARBON 8.2K 5% 1/6W
⚠R2003 R4E1 R4E3	401K5697	R.CARBON 10K 5% 1/6W
R5A5 R5B2 R5M4		
R5H5 R5H6 R611		
R643 R8D8 R831		
R832 R841 R846		
⚠R85A R851 R853		
⚠R85A R857		
R5A4	401K5699	R.CARBON 12K 5% 1/6W
⚠R2005 R6E2	401K5705	R.CARBON 22K 5% 1/6W
⚠R2004	401K5707	R.CARBON 27K 5% 1/6W
R5A9 R828	401K5713	R.CARBON 47K 5% 1/6W
R791	401K5717	R.CARBON 68K 5% 1/6W
⚠R59C	401K5719	R.CARBON 82K 5% 1/6W

SYMBOL	PARTS NO.	DESCRIPTION
R110 R111	4064C570J	R.METAL 750H 1% 1/6W
R5A1 R982	4064J871	R.METAL 8.25K 1% 1/6W
R407	4064J881	R.METAL 2.2K 1% 1/6W
R857	4064J883	R.METAL 3.3K 1% 1/6W
R5E5 R5E8	4064C691	R.METAL 5.6K 1% 1/6W
⚠R581	4064C695	R.METAL 8.2K 1% 1/6W
R4A3 R447 R406	4064C697	R.METAL 10K 1% 1/6W
R5C2 R556		
R446 R5A6	4064C698	R.METAL 11K 1% 1/6W
R5C4	4064C699	R.METAL 12K 1% 1/6W
R768	4064C7D1	R.METAL 15K 1% 1/6W
R563	4064C702	R.METAL 16K 1% 1/6W
R3C3	4064C703	R.METAL 18K 1% 1/6W
R5C6	4064C705	R.METAL 22K 1% 1/6W
R5C8	4064C707	R.METAL 27K 1% 1/6W
R4A8	4064C709	R.METAL 30K 1% 1/6W
R5C5 R559 R681	4064C711	R.METAL 36K 1% 1/6W
⚠R5A6 R686	4064C717	R.METAL 56K 1% 1/6W
R561 R6E4 R763	4064C719	R.METAL 68K 1% 1/6W
R4A4 R5C7 ⚠R5R2	4064C721	R.METAL 100K 1% 1/6W
⚠R5N3		
R5C7 R764	4064C723	R.METAL 120K 1% 1/6W
R4A5	4064C724	R.METAL 130K 1% 1/6W
R767	4064C726	R.METAL 160K 1% 1/6W
⚠R5R5	4064C729	R.METAL 220K 1% 1/6W
R814	4064C734	R.METAL 680K 1% 1/6W
R613	4064C743	R.METAL 8.06K 1% 1/6W
R751	4064J843	R.METAL 1.3K 0.5% 1/8W
⚠R2001 ⚠R562 ⚠R572	4064C819	R.METAL 2.2H 5% 1/4W
⚠R4F ⚠405 ⚠R901	4064C139	R.METAL 10H 5% 1/4W
⚠R994		
⚠R54F6	404K5135	R.METAL 27H 5% 1/4W
R618	4040S125	R.METAL 10H 5% 1/4W
R983	4049A649	R.METAL 10K 2% 1W
R805 R5H3 R5H4	4049B507	R.METAL 0.22H 5% 1/2W
⚠R994	40A6A107	R.FUSE 1.8A 5% 1/2W
⚠R581	40A6A157	R.FUSE 220H 5% 1/2W
R5A6	4081J907	R.FUSE 1.0A 5% 2W

SYMBOL			PARTS NO	DESCRIPTION
*** CAPACITORS ***				
C402	C6F2		42AA1509	C,CHIP CERAMIC 50V 100DPF
C514			42AA1511	C,CHIP CERAMIC 50V 150DPF
C408			42AA1513	C,CHIP CERAMIC 50V 220DPF
C629	C7N2		42AA1515	C,CHIP CERAMIC 50V 330DPF
C631	C792		42AA1517	C,CHIP CERAMIC 50V 470DPF
C513			42AA1520	C,CHIP CERAMIC 50V 820DPF
C623	C825	C835	42AA1521	C,CHIP CERAMIC 50V 0.01UF
C630	C832		42AA1523	C,CHIP CERAMIC 50V0.015UF
C751			42AA1527	C,CERAMIC 25V 0.01UF
C7510			42AA1538	C,CERAMIC 25V 0.1UF
C224	C226	C228	42AA2721	C,CERAMIC 50V 0.1UF
C533	C536	C601		
C882	C883	C713		
C421	C422	C471	42AA2726	C,CERAMIC 50V 0.01UF
C774	C702B	C702G		
C702E	C704B	C704G		
C704R	C712B	C712G		
C712R	C719	C857		
C875	C882			
C423	C430	C5K9	42AA2744	C,CERAMIC 25V 0.1UF
C5K2	C5K7	C5K9		
C50A	C50C	C50E		
C50F	C50G	C50P		
C500	C501	C502		
C503	C504	C505		
C508	C509	C513		
C516	C521	C523		
C524	C528	C827		
C531	C532	C7E1		
C7H2	C7H5	C7H7		
C7H9	C7K9	C7N5		
C70A	C70E	C70KB		
C70KE	C70KR	C70PB		
C70PE	C70PR	C707B		
C707E	C707R	C708B		
C708E	C708R	C71A		
C71EB	C71EE	C71ER		
C714B	C714E	C714R		
C715B	C715E	C715R		
C717B	C717E	C717R		
C721B	C721E	C721R		

SYMBOL			PARTS NO	DESCRIPTION
C573	C958	C961	423A2045	C,CERAMIC 50V 100PF
C965				
C462			423A2104	C,CERAMIC 50V 220PF
C469			423A2111	C,CERAMIC 50V 100PF
C941	C8F5		427F4601	C,FILM 50V 100DPF
C5K4			427F4602	C,FILM 50V 150DPF
C7F2			427F4607	C,FILM 50V 330DPF
C8F5			427F4609	C,FILM 50V 470DPF
C6A1			427F4617	C,FILM 50V 0.022UF
C407			427F4623	C,FILM 50V 0.068UF
C6F1	C6I4	C7A9	427F4625	C,FILM 50V 0.1UF
C7A5	C7A7	C7F1	427F4629	C,FILM 50V 0.22UF
C523			427F4651	C,FILM 50V 1.0UF
C5E5			427F4693	CQ93M1H471J-BT
ΔC5P4			427G3458	C,FILM 630V 390DPF
ΔC5R2			427G6025	C,FILM 50V 0.1UF
C7A1	C7A3	C7T1	428B3013	C,METAL FILM 50V 0.1UF
C5C1			428B3021	C,METAL FILM 50V 0.47UF
C5A4			428B3025	C,METAL FILM 50V 1.0UF
C5K3	C5L2		428B3817	C,METAL 50V 0.22UF
C506			428B3819	C,METAL 50V 0.33UF
C5C2			428C9001	C,METAL FILM 100V 0.068UF
C481			428C9022	C,METAL FILM 250V 0.1UF
ΔC5P2			428D6025	C,METAL 100V 1.0UF
C472			428D6081	C,METAL 250V 0.01UF
C455	C724B	C724G	428D0097	C,FILM 250V 0.22UF
C724R				
C810			428D0165	C,FILM 400V 0.022UF
C408			428D4317	C,METAL FILM 100V 0.22UF
C581			428D5001	C,METAL 400V 0.1UF
ΔC5P3			428G8501	C,METAL FILM 1.6KV 1000PF
ΔC583			42816352	C,FILM 250V 0.12UF 5%
ΔC586			42816353	C,FILM 250V 0.18UF 5%
ΔC584	ΔC585		42816377	C,FILM 250V 0.130F 5%
ΔC587			42816379	C,FILM 250V 0.24UF 5%
ΔC588			42816380	C,FILM 250V 0.30UF 5%
ΔC589			42816383	C,FILM 250V 0.51UF 5%
ΔC5A			42816384	C,FILM 250V 0.62UF 5%
ΔC601			42824851	C,FILM 250V 0.47UF
C595			42898004	C,METAL 250V 1.5UF

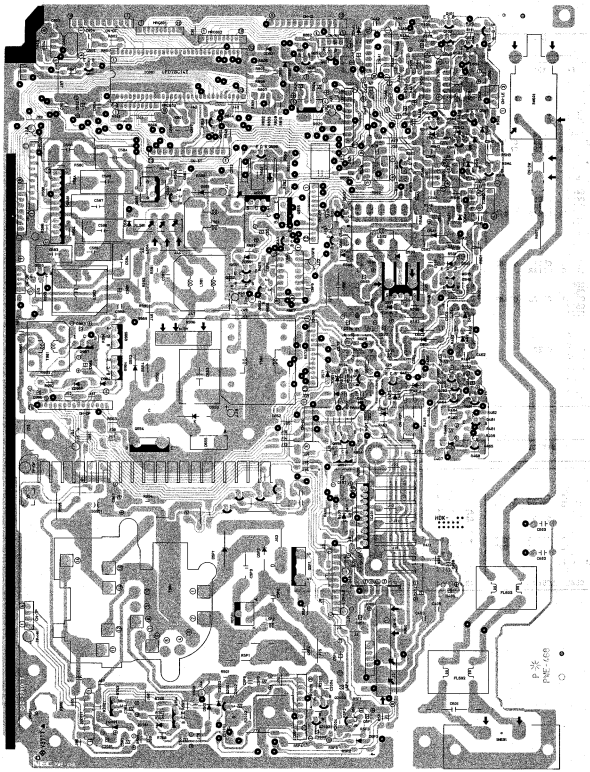
SYMBOL			PARTS NO	DESCRIPTION
C732	C743B	C743G	42AA2744	C,CERAMIC 25V 0.1UF
C743R	C744B	C744G		
C744R	C753	C754		
C755	C757	C758		
C766	C756	C766		
C767	C796	C798		
C8A2	C953	C953		
C954	C965	C971		
C973				
C716	C723B	C723G	42CA1432	C,CERAMIC 50V 47PF
C723R				
C79F			42CA1438	C,CERAMIC 50V 82PF
C79K			42CA1444	C,CERAMIC 50V 150PF
C50J			42CA1452	C,CERAMIC 50V 330PF
C85E	C85F	C85G	42CA1456	C,CERAMIC 50V 470PF
C854	C955	C85G		
C902			42D09551	C,CERAMIC 500V 100PF
C901			42D09557	C,CERAMIC 500V 330PF
C5A5	ΔC581	C742B	42D09583	C,CERAMIC 500V 1000PF
C742G	C742R	C751		
C985	C988			
C5A2			42D09567	C,CERAMIC 500V 2200PF
C904			42D09019	C,CERAMIC 2KV 100DPF
ΔC602	ΔC603	ΔC605	42E6C067	C,CERAMIC 2KV 2200PF
ΔC606	ΔC607	ΔC609		
C811	C816		42DJJ068	C,CERAMIC 2K 220PF
C725			42DJ9118	C,CERAMIC 500V 0.01UF
C903			42C40108	C,CERAMIC 2KV 0.01UF
C4A2	C4A3	C5H2	421A0425	C,CERAMIC 50V 0.01UF
C552	C808	C954		
C819			421C0211	C,CERAMIC 50V 680PF
C85C			421C0212	C,CERAMIC 50V 820PF
C5H5	C90A		421C0213	C,CERAMIC 50V 1000PF
ΔC2004	C403	C405	421D6009	C,CERAMIC 25V 0.1UF
C5C9	C5C8	C5C8		
C5N3	C5N4	ΔC5P6		
C581	C8F4	C891		
C893	C852	C972		
C5A3			423A1101	C,CERAMIC 50V 47DPF
C817	C818		423A2015	C,CERAMIC 50V 10PF
C804	C805		423A2037	C,CERAMIC 50V 47PF

SYMBOL			PARTS NO	DESCRIPTION
ΔC604	ΔC613		42899098	C,FILM 250V 0.1UF
ΔC553			42899173	C,METAL 2.0KV 4200P
C7E8			43086015	C,ELEC 16V 100UF
C7N4	C7GT		43086026	C,ELEC 16V 47UF
C7E7			43086039	C,ELEC 16V 10UF
C781			43086050	C,ELEC 16V 220UF
C802			43086032	C,ELEC 16V 47UF
C7E1A			43086039	C,ELEC 16V 22UF
C464A			43086041	C,ELEC 25V 47UF
C5C7	C7A8	C7E6	43086051	C,ELEC 50V 10UF
C4A5	C4A6	C7N3	43086065	C,ELEC 50V 100UF
C7DNB	C7DNG	C7GNR		
C7DNG	C7DNR	C7GNR		
C996				
C4A1			43086067	C,ELEC 50V 33UF
ΔC597			43086068	C,ELEC 100V 10UF
C7EE			43086099	C,ELEC 100V 22UF
C782			43086130	C,ELEC 25V 100UF
C792			43086563	C,ELEC 250V 2.2UF
C476	C70F	C7D5	43088144	C,ELEC 16V 47UF
C7D6	C8A1			
C709			43088145	C,ELEC 16V 100UF
C85H	C85K	C85L	43088173	C,ELEC 50V 3.3UF
C857	C858	C859		
C7F7			43088179	C,ELEC 50V 10UF
ΔC2003	ΔC5F1	C8E8	43089018	C,ELEC 16V 1000UF
C68K	C76H	C79E	43089017	C,ELEC 10V 220UF
C6E7			43089030	C,ELEC 10V 1000UF
C772			43089025	C,ELEC 16V 22UF
C713	C713G	C713R	43089028	C,ELEC 16V 47UF
C752	C755			
C925	C70LB	C70LG	43089029	C,ELEC 16V 100UF
C70LR	C71F			
C722	C76G		43089030	C,ELEC 16V 220UF
C6E3			43089033	C,ELEC 16V 1000UF
C822			43089038	C,ELEC 25V 10UF
C425	C428	C494	43089041	C,ELEC 25V 47UF
ΔC5P5	C50B	C50D		
C933	C812	C952		
C956				

SYMBOL			PARTS NO	DESCRIPTION
C75K	C851	C853	430B9042	C.ELEC 25V 100UF
C627			430B9043	C.ELEC 25V 220UF
C6E2	C6E5		430B9045	C.ELEC 25V 470UF
C50K	C637	C793	430B9061	C.ELEC 50V 1.0UF
C963				
C515	C519	C621	430B9062	C.ELEC 50V 2.2UF
C711B	C711C	C711R	430B9063	C.ELEC 50V 3.3UF
C956	C974		430B9064	C.ELEC 50V 4.7UF
△C9R1	C934	C70WB	430B9065	C.ELEC 50V 10UF
C70WG	C70WR	C824		
C825				
△C2001			430B9066	C.ELEC 50V 22UF
C983			430B9068	C.ELEC 50V 47UF
C664			430B9069	C.ELEC 50V 100UF
C407			430B9070	C.ELEC 50V 220UF
C404	C40B		430B9071	C.ELEC 50V 330UF
C727	C984		430B9101	C.ELEC 100V 47UF
C741B	C741G	C741R	430B9512	C.ELEC 160V 1.0UF
C764			430B9514	C.ELEC 160V 3.3UF
△C5G1			430B9516	C.ELEC 160V 10UF
C745			430B9518	C.ELEC 160V 33UF
C5A1			430B9554	C.ELEC 250V 3.3UF
C976			430C0136	C.ELEC 10V 47UF
C5W8	C507	C718B	430C0244	C.ELEC 16V 47UF
C718G	C718R			
C5K1			430C0245	C.ELEC 16V 100UF
C628			430C0261	C.ELEC 35V 4.7UF
C718B	C718G	C718R	430C0278	C.ELEC 50V 2.2UF
C512			430C0279	C.ELEC 50V 10UF
C534			430C8522	C.ELEC 25V 330UF
C594			430JH107	C.ELEC 250V 4.7UF
C593			430JJ231	C.ELEC 250V 10UF
C6E6			4302J048	C.ELEC 25V 1000UF
C6E1	C6E9		4302J047	C.ELEC 25V 2200UF
C6A8			4302J102	C.ELEC 100V 100UF
C8A7			4302J105	C.ELEC 100V 470UF
C8A4			4302J559	C.ELEC 250V 47UF
C8A3			4302J560	C.ELEC 250V 100UF
C592			4302J655	C.ELEC 250V 33UF
C551			4304B048	C.ELEC 35V 1000UF

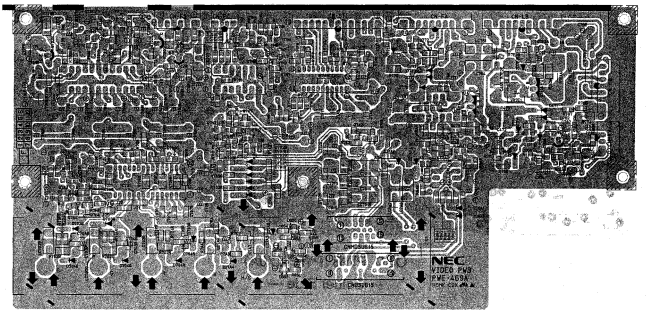
SYMBOL			PARTS NO	DESCRIPTION
△C6P1			43099198	C.ELEC 100V 120UF
△C609			43113081	C.ELEC 400V 47UF M
C7HEB	C7H6G	C7H6R	433A4027	C.ELEC 16V 220UF
C70RB	C70RG	C70RR		
C981			433A4033	C.ELEC 25V 10UF
C7A2	C7A5		433A4056	C.ELEC 50V 2.2UF
C4A8			433A6143	C.ELEC 16V 10UF
C701B	C701G	C701R	433A6147	C.ELEC 16V 47UF
C703B	C703G	C703R		
C7A4			433A6179	C.ELEC 50V 2.2UF
△C2002			433A7002	C.ELEC 10V 47UF
C522			433A7013	C.ELEC 16V 47UF
C58L	△C58M		433A7014	C.ELEC 16V 100UF

PRINTED WIRING BOARDS

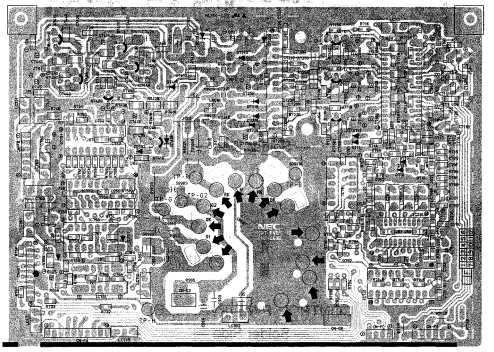


DEF PWB (PWB-468)

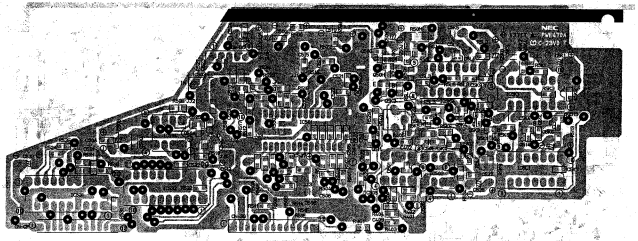
— Solder Side —



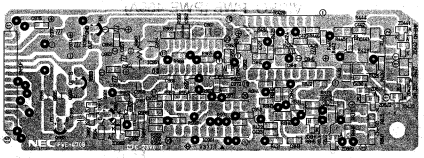
VIDEO PWB (PWE-469A)
— Solder Side —



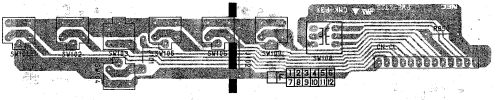
CRT PWB (PWE-469B)
— Solder Side —



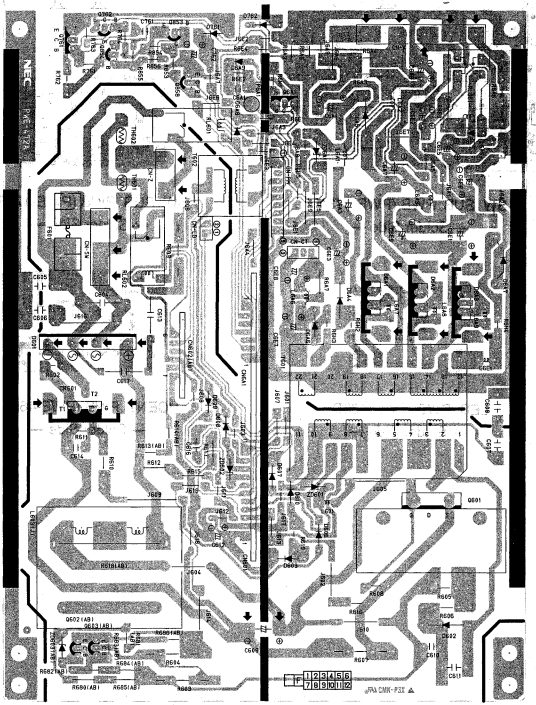
OSC PWB (PWE-470A)
— Solder Side —



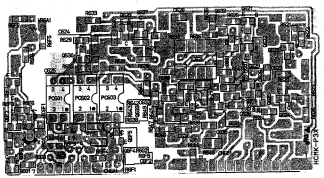
DF PWB (PWE-470B)
— Solder Side —



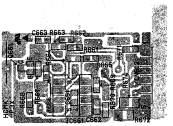
CONTROL PWB (PWE-472B)
— Solder Side —



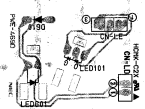
SW MAIN PWB (PWE-472A)
— Solder Side —



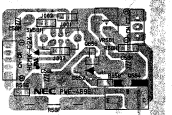
SW SUB PWB (PWE-473A)
— Solder Side —



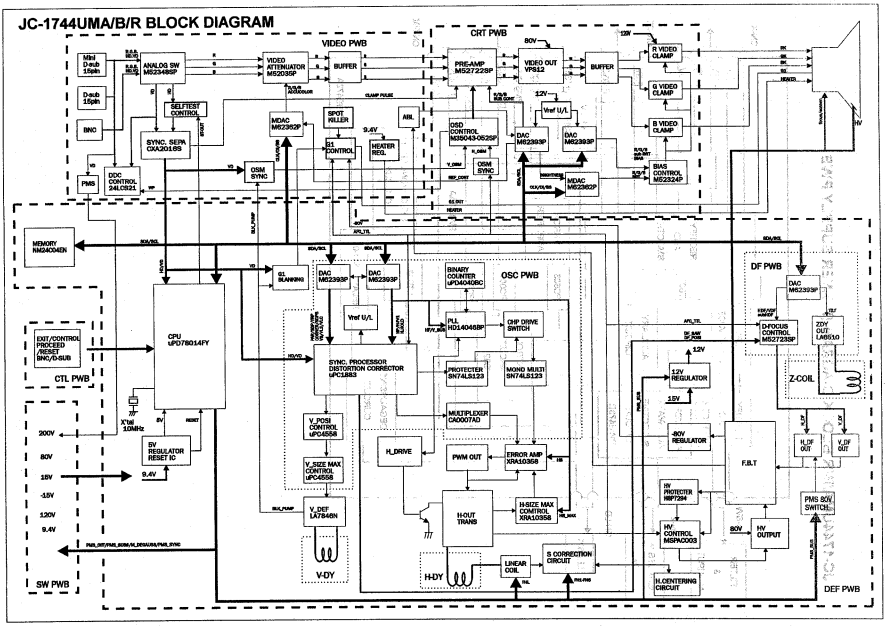
SW SUB PWB (PWE-473B)
— Solder Side —



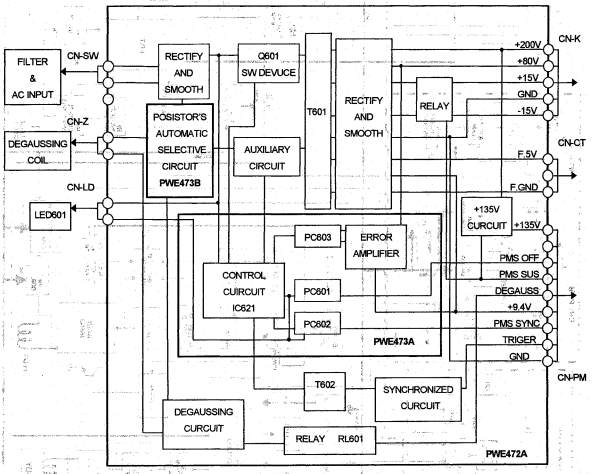
LED PWB (PWE-469D)
— Solder Side —



HCENT PWB (PWE-469E)
— Solder Side —


JC-1744UMA/B/R BLOCK DIAGRAM
VIDEO PWB
CRT PWB
DF PWB
OSC PWB
CTL PWB
SW PWB
DEF PWB
MINI D-sub 15pin
D-sub 15pin
BNC
ANALOG SW M62348SP
VIDEO ATTENUATOR M52035P
BUFFER
SELFTEST CONTROL
SYNC. SEPA CXA2016S
DDC CONTROL 24LC021
PMS
OSM SYNC
MDAC M62392P
SPOT KILLER
ABL
G1 CONTROL
HEATER REGL.
PRE-AMP M52722SP
VIDEO OUT VPS12
R VIDEO CLAMP
G VIDEO CLAMP
B VIDEO CLAMP
OSD CONTROL M38043-062SP
DAC M62393P
Vref U/L
BIAS CONTROL M52324P
MDAC M62362P
MEMORY NM24C04EN
G1 BLANKING
BINARY COUNTER uPD4040BC
PLL HD14046BP
CHP DRIVE SWITCH
SYNC. PROCESSOR DISTORTION CORRECTOR uPC1883
PROTECTER SN74LS123
MONO MULTI SN74LS123
MULTIPLEXER CA0007AD
V_POSI CONTROL uPC4558
V_SIZE MAX CONTROL uPC4558
H_DRIVE
PWM OUT
ERROR AMP XRA10358
H-SIZE MAX CONTROL XRA10358
V_DEF LA7846N
H-OUT TRANS
V-DY
H-DY
LINEAR COIL
S CORRECTION CIRCUIT
H.CENTERING CIRCUIT
EXIT/CONTROL PROCEED /RESET BNC/D-SUB
CPU uPD78014FY
X'tal 10MHz
5V REGULATOR RESET IC
200V
80V
15V
-15V
130V
9.4V
D-FOCUS CONTROL M62733SP
ZDY OUT LA6510
Z-COIL
12V REGULATOR
-80V REGULATOR
H_DY OUT
V_DY OUT
F.B.T
HV PROTECTER RIF724
HV CONTROL M62PNC003
HV OUTPUT
PMS 80V SWITCH
DAC M62393P

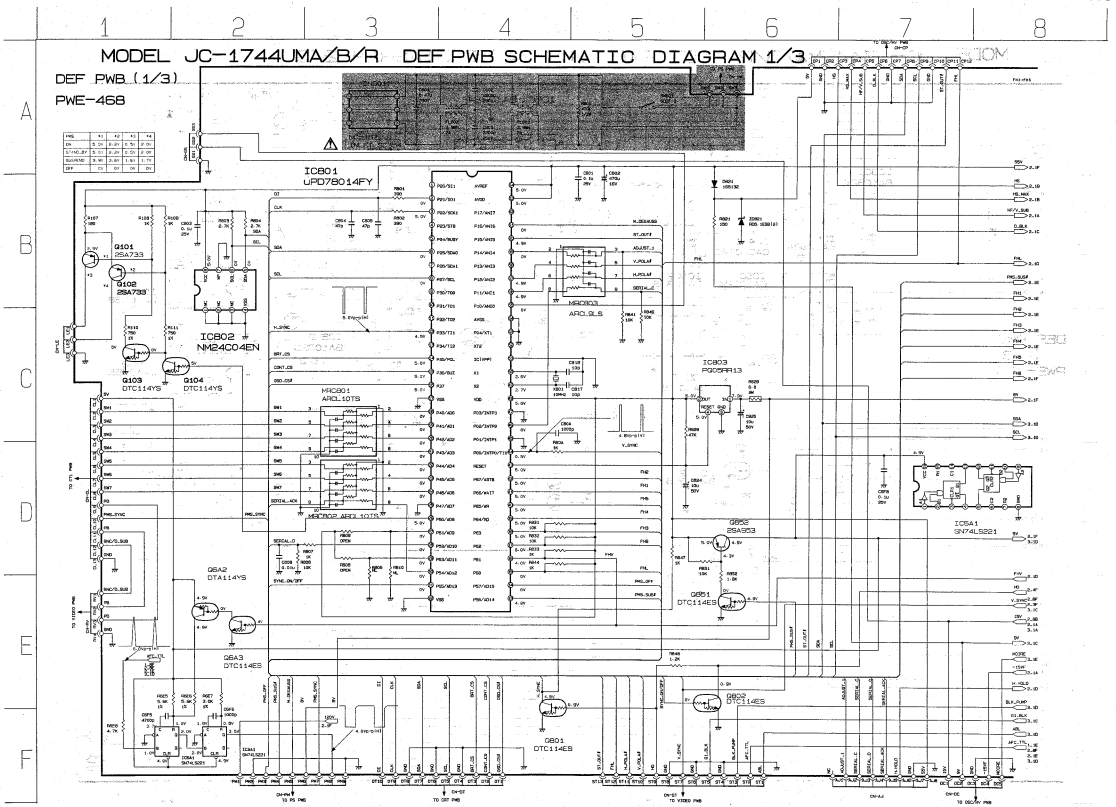
JC-1744UMA/B/R BLOCK DIAGRAM (POWER SUPPLY PWB)



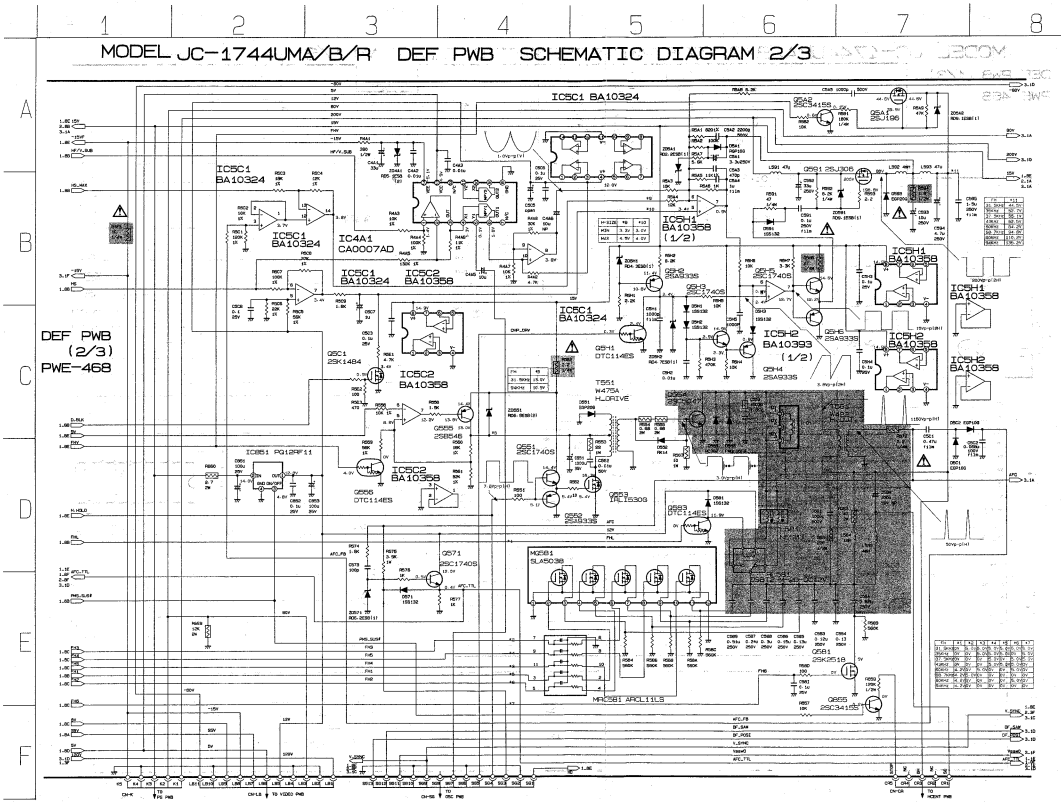
MODEL JC-1744UMA/B/R DEF PWB SCHEMATIC DIAGRAM 1/3

DEF PWB (1/3)

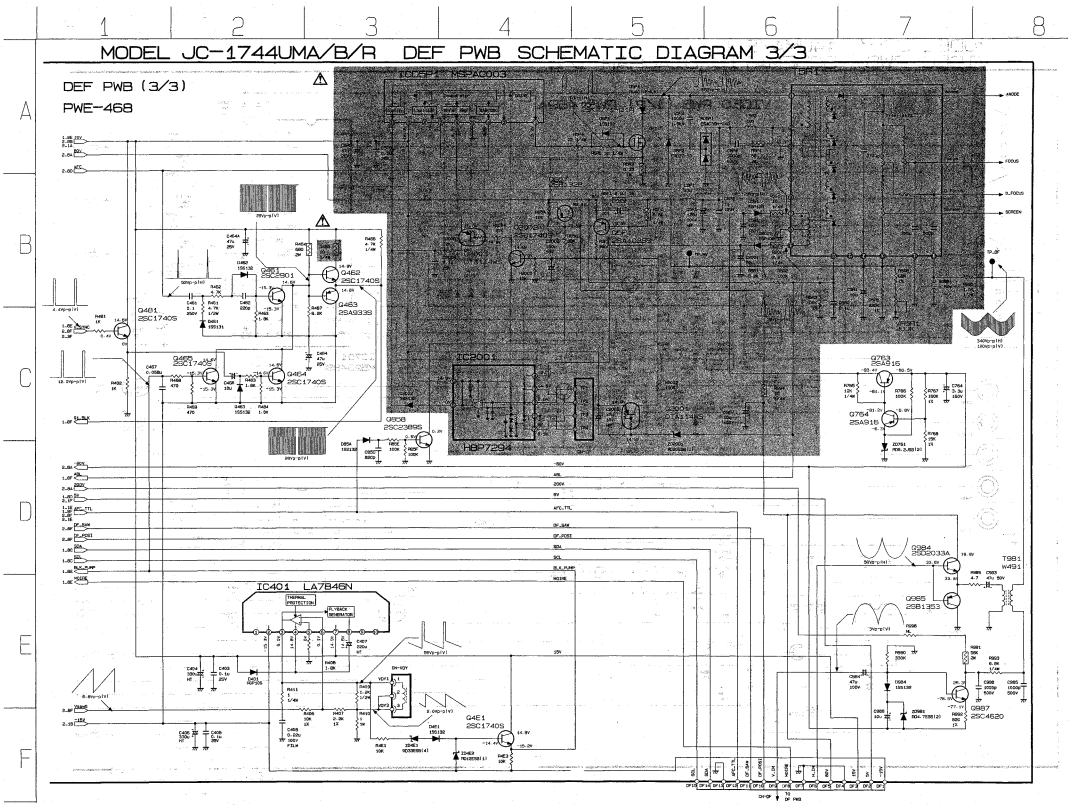
PWE-468



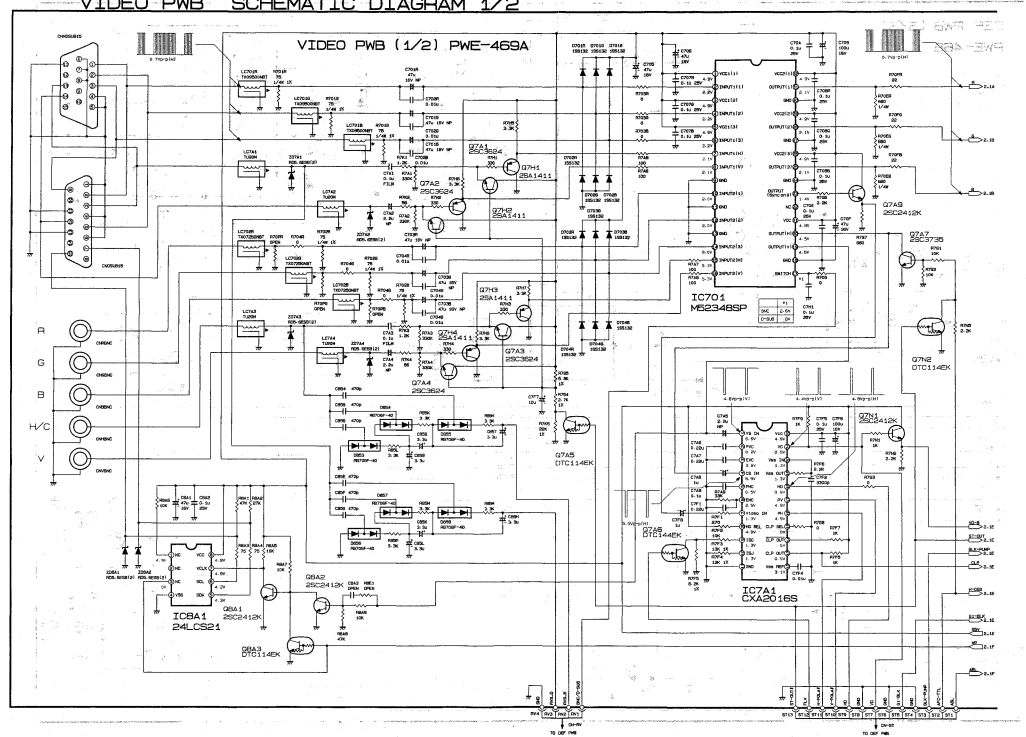
MODEL JC-1744UMA/B/R DEF PWB SCHEMATIC DIAGRAM 2/3



MODEL JC-1744UMA/B/R DEF PWB SCHEMATIC DIAGRAM 3/3



MODEL JC-1744UMA/B/R
VIDEO PWB SCHEMATIC DIAGRAM 1/2



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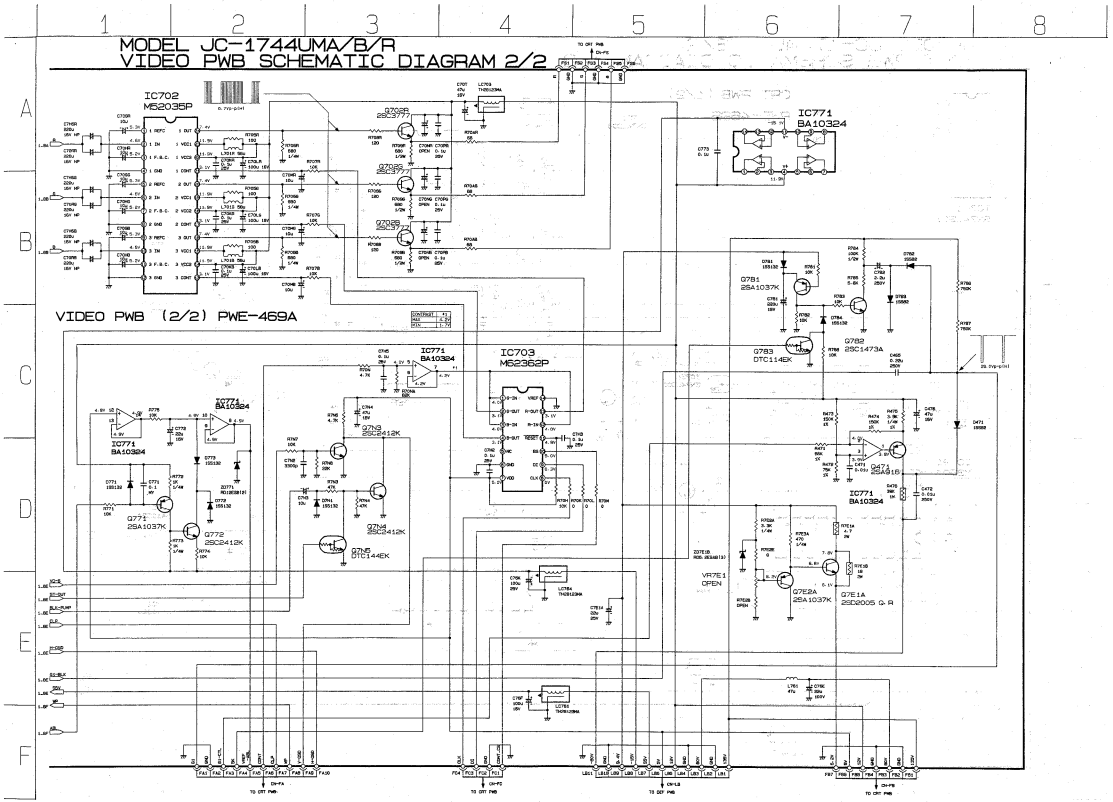
MODEL JC-1744UMA/B/R
VIDEO PWB SCHEMATIC DIAGRAM 2/2



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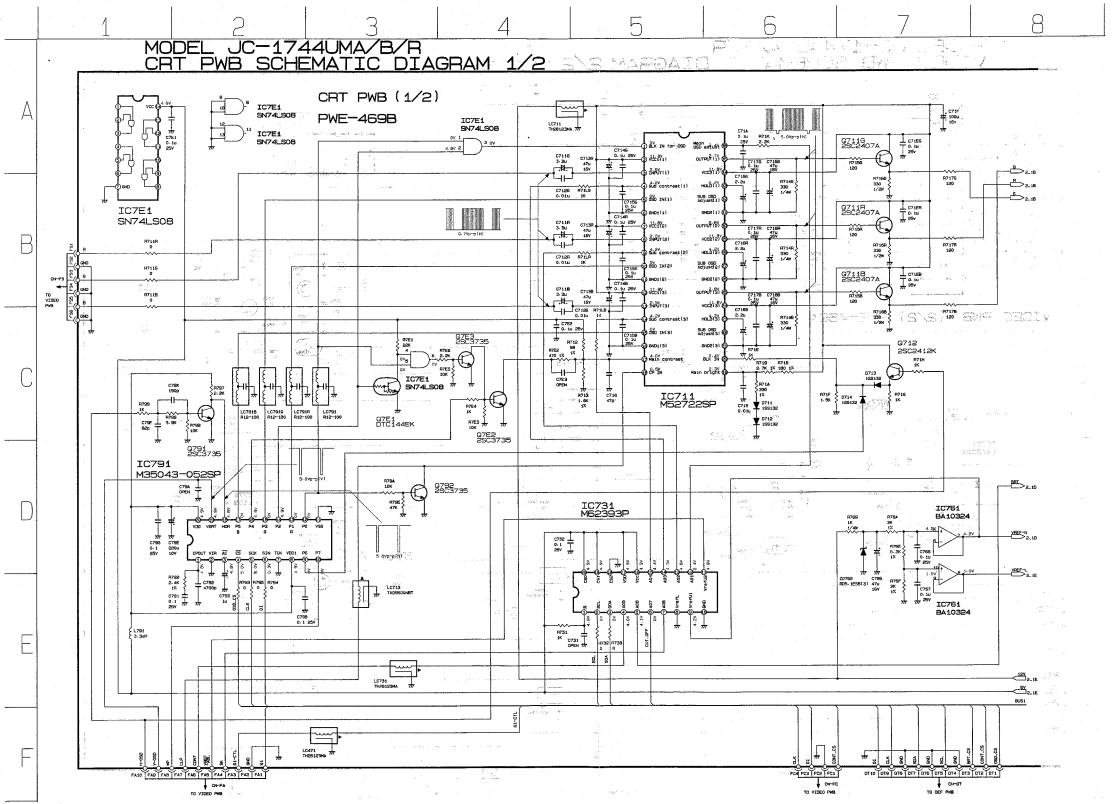
MODEL JC-1744UMA/B/R
CRT PWB SCHEMATIC DIAGRAM 1/2



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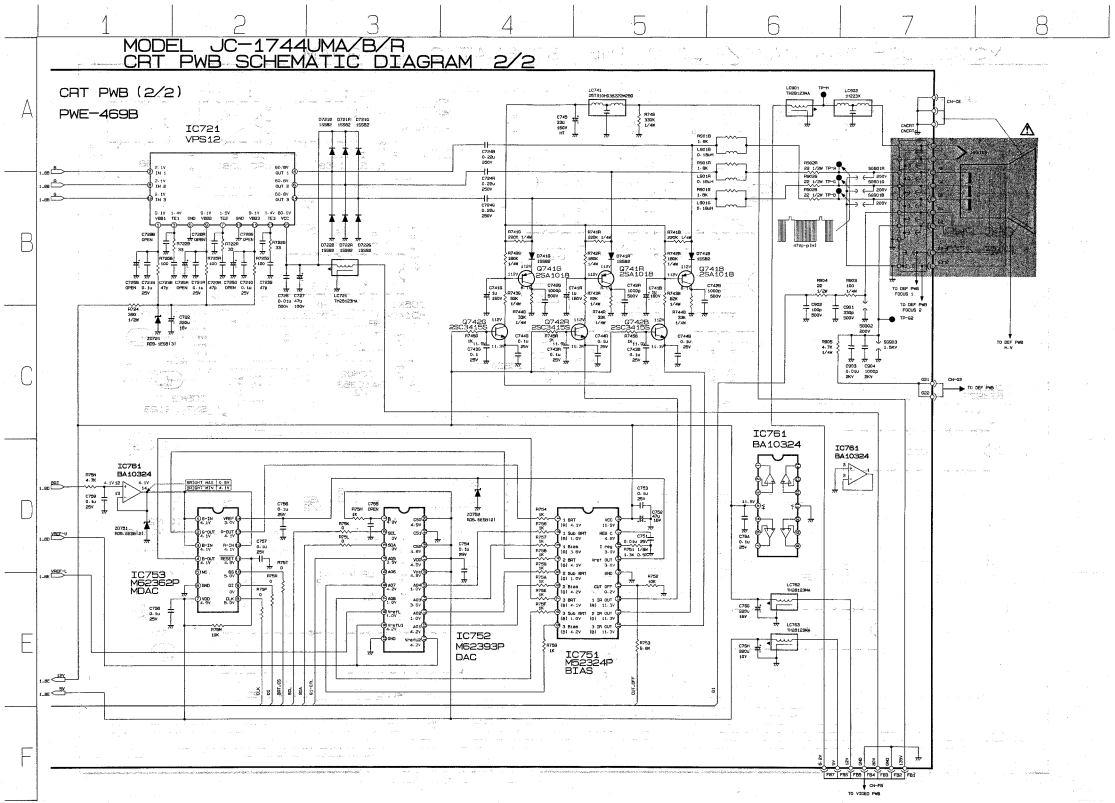
MODEL JC-1744UMA/B/R
CRT PWB SCHEMATIC DIAGRAM 2/2



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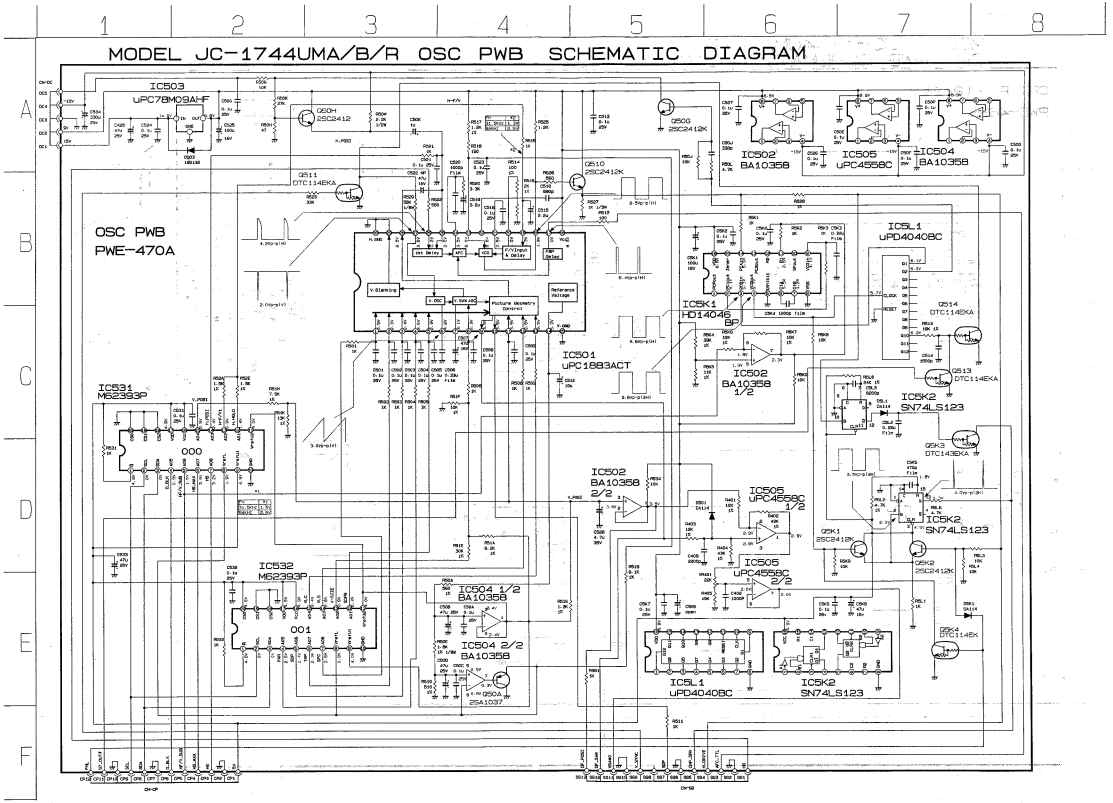
MODEL JC-1744UMA/B/R OSC PWB SCHEMATIC DIAGRAM



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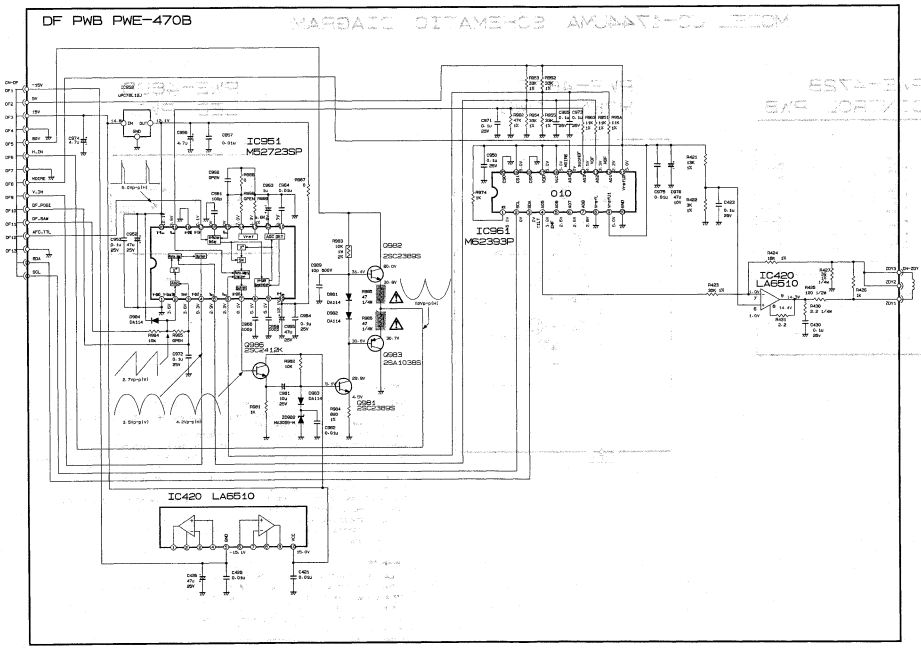
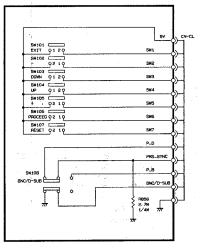
MODEL JC-1744UMA/B/R DF PWB SCHEMATIC DIAGRAM

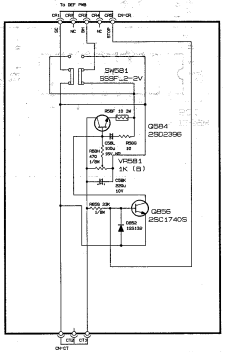


MODEL JC-1744UMA SCHEMATIC DIAGRAM

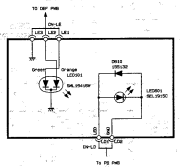
PWE-472B CONTROL PWB



PWE-469E HCENT PWB

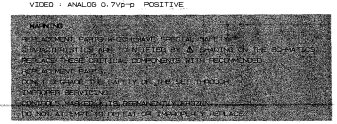


PWE-469D LED PWB



NOTES

1. RESISTOR VALUES ARE IN Ω (OHM). K=1,000Ω M=1,000,000Ω
2. RESISTORS OF PWE-469* AND PWE-470* ARE 1/10W AND RESISTORS OF PWE488 ARE 1/6W EXCEPT WHERE OTHERWISE INDICATED.
3. CAPACITOR VALUES ARE IN uF UNLESS OTHERWISE INDICATED. p=pF
4. ALL CAPACITORS ARE 50VOLTS EXCEPT WHERE OTHERWISE INDICATED.
5. VOLTAGES AND WAVEFORMS ARE MEASURED UNDER THE INVERTED 'H' CHARACTER SIGNALS IN THE CONDITIONS OF THE CONTRAST CONTROL IS MAXIMUM THE BRIGHTNESS CONTROL IS MINIMUM AND ALL OTHER CONTROLS ARE NORMAL OPERATION.
6. (H) : HORIZONTAL RATE (V) : VERTICAL RATE
7. VOLTAGES AND WAVEFORMS ARE MEASURED UNDER THE FOLLOWING SYNC AND VIDEO EXCEPT WHERE OTHERWISE INDICATED.
   SYNC : HORIZONTAL RATE 31.5KHz TTL LEVEL NEGATIVE.
   VERTICAL RATE 60Hz TTL LEVEL NEGATIVE.
   VIDEO : ANALOG 0.7Vp-p POSITIVE



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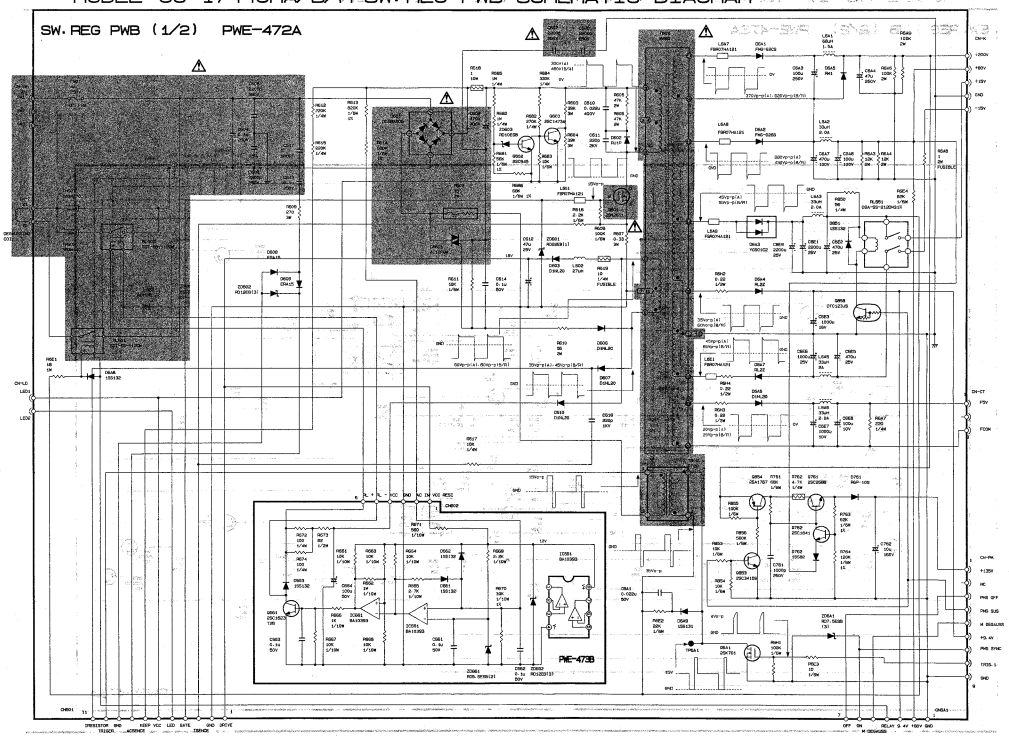
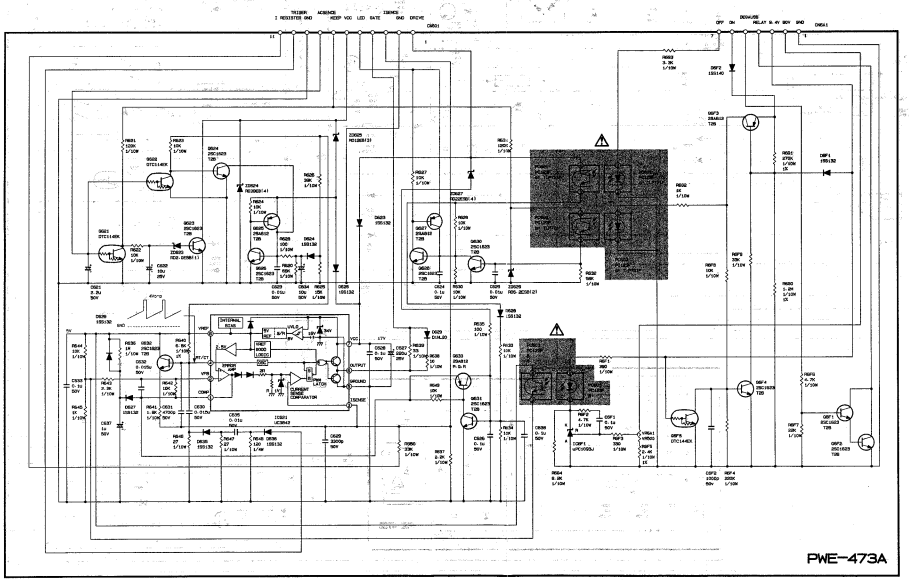
MODEL JC-1744UMA/B/R SW. REG PWB SCHEMATIC DIAGRAM



MODEL JC-1744UMA/B/R SW. REG PWB SCHEMATIC DIAGRAM

SW. REG PWB (2/2) PWE-473A



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